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SCOTTISH

CRYPTOGAMIC FLORA,

OR

COLOURED FIGURES AND DESCRIPTIONS OF CRYPTOGAMIC PLANTS, BELONGING CHIEFLY TO THE ORDER *FUNGI;*

AND

INTENDED TO SERVE AS A CONTINUATION

OF

ENGLISH BOTANY.

BY

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LL.D. F.L.S. F.R.S. & F.A.S.E.

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PEZIZA ÆRUGINOSA.

Verdigris-green Peziza.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link.*
SERIES III. PHIALEA.—TRIBE X. CALYCINÆ, *Fries.*

GENERIC CHARACTER.

Pileus stipitatus aut sessilis, plus minusve cupuliformis vel complanatus, tubulis elongatis sporuliferis in pagina superiore.

Pileus stipitate or sessile, dilated upwards into a cup-shaped or flattish receptacle, with tubular, elongated sporuliferous cells in the upper surface or disk.

SPECIFIC CHARACTER.

PEZIZA æruginosa; *æruginosa, turbinata, demum expansa subflexuosa, stipite brevi.*

P. verdigris-green, turbinate, at length spreading, somewhat flexuose, the stipes short.

PEZIZA æruginosa, *Pers. Obs. Mycol.* fasc. 1. p. 27.—*Syn. Fung.* p. 663.—*Mycol. Europ.* 1. p. 291.—*Fl. Dan.* t. 1200. f. 1.—*Holmsk.* v. 2. p. 28. t. 12.—*Alb. et Schwein.* p. 334.—*Schum. Fl. Sæll.* 2. p. 430.—*Schwein. Fung. Carol.* No. 1230.—*Fries, Syst. Mycol.* v. 2. p. 130.

PEZIZA viridissima, &c. *Hall. Helv.* No. 2236.

HELVELLA æruginosa, *Fl. Dan.* t. 1260. f. 2.—*Dicks. Crypt.* fasc. 2. p. 24.—*Sow. Fung.* t. 347.—*With. Bot. Arr.* ed. 6. v. 4. p. 409.—*Pers. Syn.* p. 617.—*Purt. Midl. Fl.* v. 3. p. 258.

HAB. On dead half rotten wood. Autumn. It is not unfrequent in the barren state, as shown by the colour of the wood, but it rarely comes to perfection.

Plant verdigris-green, staining the wood on which it grows to a considerable depth of the same colour. *Pileus* or *Cup* 2–3 lines in breadth, fleshy, glabrous, stipitate, at first turbinate, at length spreading, often irregularly, somewhat waved, the margin occasionally bent downwards. *Stipes* 1–2 lines in height, cylindrical, dilated at the top. *Thecæ* filiform. *Sporidia* I have not seen.

A variety, or perhaps a state only of the plant, has the disk of a whitish colour.

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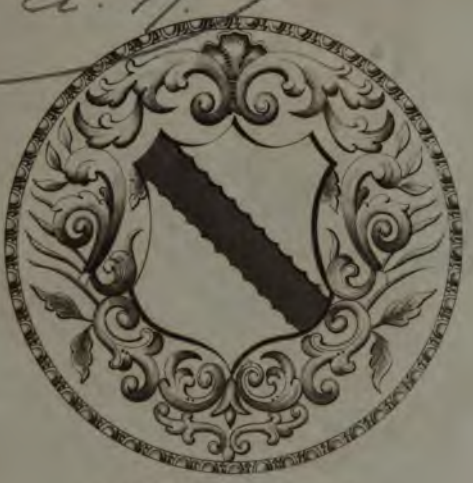

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PERSOON, after describing this *Thelephora* as a distinct species in his Tentamen Dispositionis Methodicæ Fungorum, became doubtful, in the Synopsis Fungorum, whether it might not be a variety of *Thelephora calcea;* but in his recent Mycologia Europæa, he again considers it as distinct. In the mean time, between the publication of the Synopsis and the Mycologia, FRIES named it *Thelephora cretacea*, in his Observationes Mycologicæ, and observed that it was "vere distincta species." Yet I cannot find it mentioned in any way in the Systema Mycologicum of that author.

Fig. 1. Thelephora Sambuci, *growing on wood.* Fig. 2. *The same on soil,* natural size. Fig. 3. *A portion of a plant.* Fig. 4. *Thecæ.* Fig. 5. *Thecæ with Sporidia.* Fig. 6. *Sporidia;* magnified.

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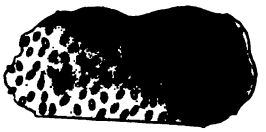

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PALMELLA PROTUBERANS.

Soft shapeless Palmella.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *CHÆTOPHOROIDEÆ, Grev.*—ALGÆ, *Juss.*

GENERIC CHARACTER.

"*Gelatina hyalina, expansa vel globosa, granulis discretis globosis vel ellipticis farcta.*"—AG.

Receptacle hyaline, gelatinous, spreading, globose, filled with distinct globular or elliptical granules.

SPECIFIC CHARACTER.

PALMELLA protuberans; *crassa, irregulariter lobata, mollissima, viridis, granulis ellipticis.*

P. thick, irregularly lobed, very soft, green, the granules elliptical.

PALMELLA protuberans, *Grev. Fl. Edin.* p. 323.—*Ag. Syst. Alg.* p. 14.

ULVA protuberans, *Smith, Eng. Bot.* t. 2583.

HAB. Moist rocks, among mosses. Spring to Autumn. Campsie Glen, near Glasgow, Dr HOOKER and Dr GREVILLE. Pentland Hills, Edinburgh. In England, it was first discovered by Mr W. BORRER on wet sandstone rocks at Uckfield in Sussex, in 1813.

Frond spreading among mosses, in irregular masses, half an inch to one inch or more in breadth, thick, roundish, lobed, somewhat diaphanous, very soft and gelatinous, easily destroyed; *colour* green, but varying in shade, sometimes olivaceous. *Sporidia* elliptical, dispersed through the whole mass.

The plant here described agrees in all points with that found in Sussex by Mr W. BORRER. It is by no means uncommon in Scotland, but it is difficult to procure it in a good state, as its tender consistence renders it liable to be destroyed by very slight causes. As it grows old, it appears to fall into shapeless masses by its own weight, especially when growing among mosses on perpendicular surfaces of rocks.

Fig. 1. a, *Palmella protuberans.* b, *A mass beginning to grow shapeless;* natural size. c, *A section.* d, *Granules;* magnified.

PALMELLA BOTRYOIDES.

Small clustered Palmella.

SPECIFIC CHARACTER.

PALMELLA botryoides; *minuta; frondibus dense aggregatis, globosis, subloba-tis, viridis, granulis ellipticis.*

P. minute, fronds densely crowded, globose, somewhat lobed, green, the granules elliptical.

PALMELLA botryoides, *Lyngb. Hydroph.* p. 205.—*Grev. Fl. Edin.* p. 323.—*Ag. Syst. Alg.* p. 14.

NOSTOC botryoides, *Ag. Syn.* p. 135.

TREMELLA botryoides, *Schreb. Spicil.* p. 141.

BYSSUS botryoides, *Lightf. Fl. Scot.* 2. p. 1006.—*Dill. Hist. Musc.* p. 3. t. 1. f. 5.

HAB. On the ground, in moist heathy places, in peat-mosses, and on banks. Spring and autumn. Frequent.

Fronds minute, globose, entire or obscurely lobed, unequal in size, very numerous and crowded, of a full green colour, and a gelatinous, somewhat firm substance. *Granules* elliptical.

It appears to me that there are two plants confounded by the older botanists under the name of *Byssus botryoides*, and that this confusion has been in nowise removed by modern writers. On the one hand, this *Byssus* has been admitted as a Lichen, on the other as an Alga, while both parties claim the same synonymes, but frequently express their doubts as to the real nature of the plant. It is quite clear that the plant I have figured is not the *Lepraria botryoides* of English Botany, which is usually found on trees. But I think it is *Byssus botryoides* of DILLENIUS, as he mentions having once observed it near Hampstead, on the ground, which would surely be too particular a station for the *Lepraria*, which grows on almost every old tree. This subject will be cleared up, if possible, when I come to figure the *Lepraria botryoides* of some authors, which is also an *Alga*.

Fig. 2. a, *Palmella botryoides*, natural size. b, *A group of Fronds.* c, *Fronds.* d, *A vertical slice of a frond.* e, *Granules;* magnified.

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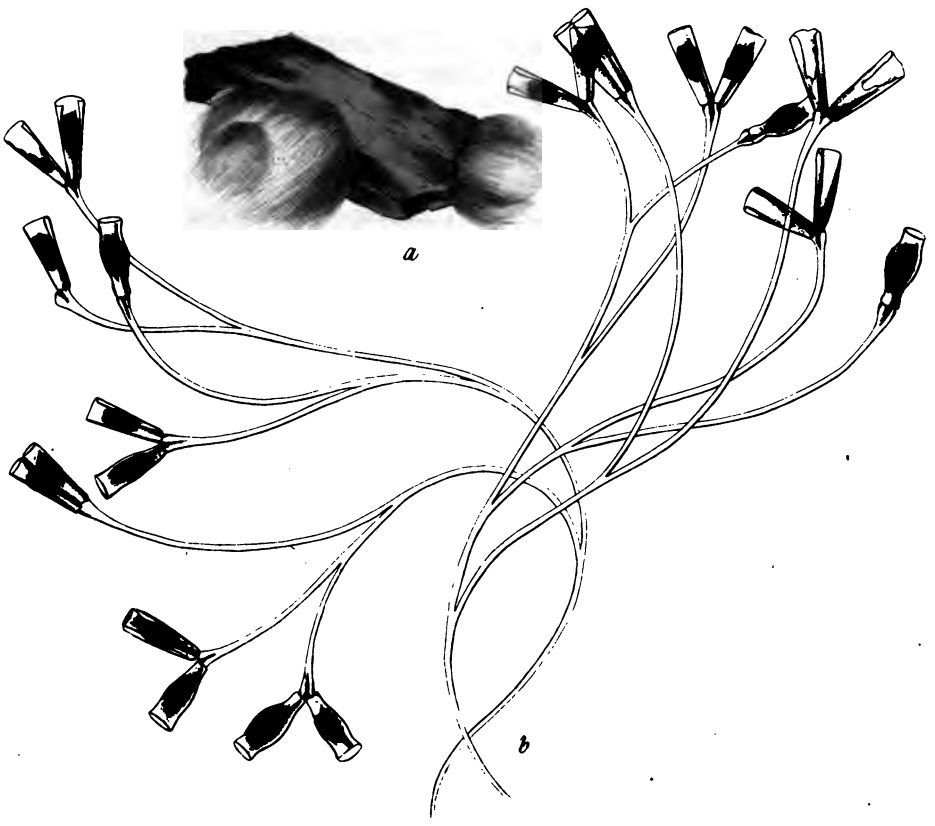

GOMPHONEMA MINUTISSIMUM.

Minute Gomphonema.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *CHÆTOPHOROIDEÆ, Grev.*—ALGÆ, *Juss.*

GENERIC CHARACTER.

"*Fila flexilia ramosa, apice clavas geminas ferentia.*—AG.

Filaments flexible, branched, producing at the extremity geminate cuneiform bodies.

SPECIFIC CHARACTER.

GOMPHONEMA minutissimum; *filis sparsis, intricatis, capillaribus ochraceis.*

G. Filaments scattered, entangled, hair-like, of an ochraceous colour.

HAB. At the margin of fresh-water lakes and ponds, investing small roots, and even the larger *Confervæ*, with a uniform woolly covering.

Plant produced so freely upon slender stems of grasses, and other small vegetable bodies beneath the surface at the margin of lakes, as to give a tawny yellowish appearance to the water. *Filaments* exceedingly slender, branched a few times, flaccid, 1–2 lines in height. *Cuneiform bodies* hyaline, containing one or two greenish granulated masses.

There can be no doubt that this production would have been referred by MÜLLER to his genus *Vorticella*; and many naturalists will therefore be inclined to regard it as an animal. AGARDH is so uncertain upon the subject, that he has placed the genus *Gomphonema* in an appendix. I am in the like perplexity, and can only say, that in the two species here described, I have not been able to detect the least motion.

Fig. 1. a, *Gomphonema minutissimum*, natural size. b, *Filaments magnified.* c, c, *Summits of filaments very highly magnified, to shew the contents of the cuneiform bodies.*

GOMPHONEMA GEMINATUM.

Tufted Gomphonema.

SPECIFIC CHARACTER.

GOMPHONEMA geminatum; *filis in cæspite globoso, fuscescente, dense intricatis.*

G. filaments entangled, forming a dense, brownish, round tuft.

GOMPHONEMA geminatum, *Ag. Syst. Alg.* p. 12.

ECHINELLA geminata, *Lyngb. Hydroph.* p. 210. t. 70.

VORTICELLA pyraria, *Müll. Inf.* t. 46. f. 1,–4.

HAB. Attached to rocks and stones in alpine rivulets. Pentland Hills. April and May. G. WALKER ARNOTT, Esq. and Dr GREVILLE.

Tufts roundish, half an inch to one inch in diameter, very soft and flaccid, of a greyish-brown colour. *Filaments* much branched in a dichotomous manner, very slender, long, entangled, each branch terminating in two wedge-shaped bodies, at first united longitudinally, afterwards diverging from each other. These *bodies* are hyaline, and contain a yellowish granulated mass, varying in size.

This species closely resembles the preceding, in the form and apparent structure of its parts, under the microscope. But it is very many times larger; and, instead of covering other aquatic plants with a continuous mass of cottony, short filaments, grows in round, dense, largish tufts, on stones and rocks in alpine streams. The situation it seems to prefer is the bed of the stream, where it can be exposed to the constant motion of the water. I have seen the bottom completely concealed by its crowded yet distinct tufts. It adheres to paper in drying, but not so perfectly as the preceding.

Fig. 2. a, *Gomphonema geminatum*, natural size. b, *Filaments;* magnified.

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POLYPORUS LUCIDUS.

Lacquered Polyporus.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link.*

GENERIC CHARACTER.

Hymenium cum pilei substantia homogeneum et concretum, poris dissepimentis tenuibus simplicibus instructum.—Pileus subcarnosus vel suberosus, plerumque subsessilis, substantia fibrosa sicca.

Hymenium of the same substance as the pileus, not separating from it, and furnished with pores connected by simple dissepiments.—Pileus subcarnose or corky, mostly subsessile; substance fibrous and dry.

SPECIFIC CHARACTER.

POLYPORUS lucidus; *pileo suberoso, stipiteque glabris, nitentibus, poris minutis, rotundis, pallidis.*—FRIES.

P. pileus corky, and, as well as the stipes, glabrous, shining; the pores minute, round, pale.

POLYPORUS lucidus, *Fries. Syst. Mycol.* v. 1. p. 353.

BOLETUS lucidus, *Leyss.—Schrad, Spicil. Fl. Germ.* p. 163.—*Curt. Fl. Lond. cum icone.—Sow. Fung.* t. 134.—*Pers. Syn. Fung.* p. 522.—*Alb. et Schwein.* p. 246.—*Fl. Dan.* t. 1253.—*Mart. Fl. Erlang.* p. 448.—*Schwein. Fung. Carol.* No. 882.—*Purt. Midl. Fl.* v. 2. p. 665.—*Hook. Fl. Scot.* Pt. 2. p. 27.

BOLETUS rugosus, *Jacq. Aust.* t. 169.—*With. Bot. Arr.* ed. 6. v. 4. p. 386.—*Relh. Fl. Cant.* ed. 3. p. 546.

BOLETUS verniceus, *Brot. Lus.* p. 468.

BOLETUS resupinatus, *Fl. Dan.* t. 894.

BOLETUS dimidiatus, *Thunb. Fl. Jap.* t. 39.

BOLETUS vernicosus, *Bergm. Phyt.* 1. t. 99.

BOLETUS nitens, *Batsch. Elench. Fung.* t. 41. f. 225.

BOLETUS obliquatus, *Bull. Champ.* p. 335. t. 7. et 459.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 121.—*Ejusd. Syn.* p. 25.

BOLETUS variegatus, *Schæff. Fung.* t. 263.

AGARICUS pseudo-Boletus, *Jacq. Aust.* t. 41.

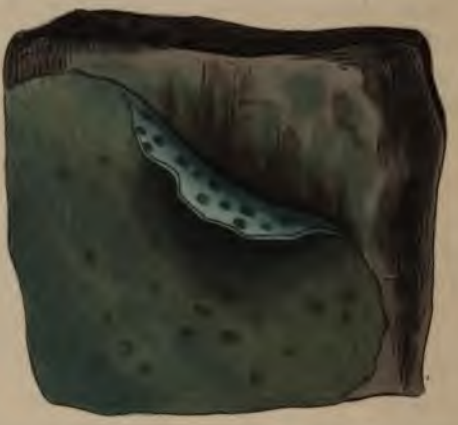
HAB. On stumps of old trees, rare. Summer. Woods at Bothwell, Mr HOPKIRK. It has been found in various places in England.

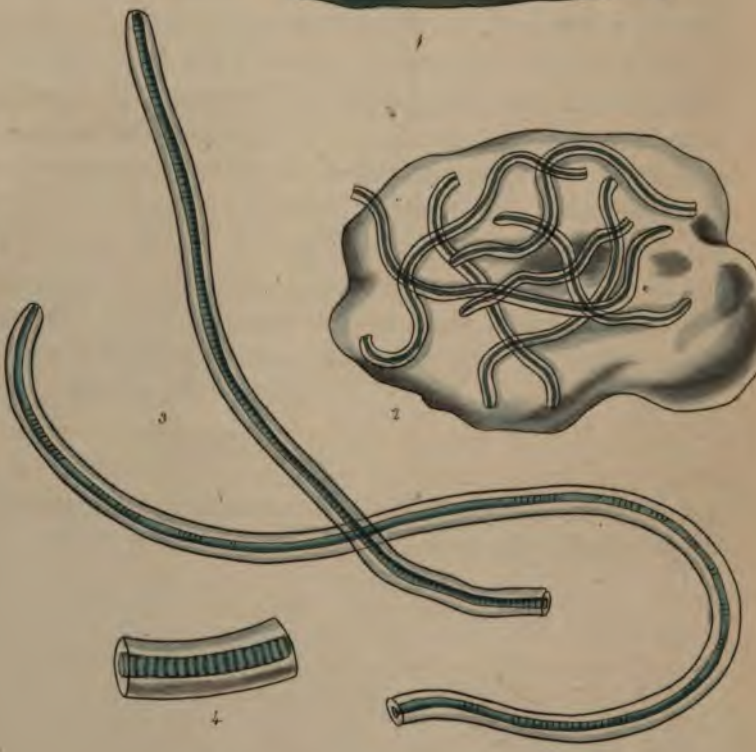
Plant of a coriaceous or corky, firm substance, very inconstant in its form. *Pileus* 4–8 inches in breadth, usually more or less reniform, sometimes flabelliform, rarely orbicular; nearly plane, rugose, and marked with concentric lines or grooves, glabrous, shining as if highly varnished.

Colour yellowish at first, then bright chesnut, in old age almost black. *Flesh* thick, very firm, delicately fibrous, pale, at length reddish; the *Pores* of the same colour, equal, roundish, very minute, either short or rather long, according to circumstances. *Stipes* either almost wanting, or 6–10 inches in height, mostly erect and lateral, rarely centrical or vertical. It is often an inch or more in thickness, very hard, of the same colour and shining appearance as the pileus.

Few species of *Polyporus* are so handsome as *P. lucidus*. Mr CURTIS relates in the Flora Londinensis, that, when he first discovered a magnificent specimen growing near Peckham, it was of so bright a colour, and so beautifully polished, that he scarcely knew whether he had found a natural or artificial production. I have had no opportunity of tracing the growth of this fungus; but Mr PURTON informs us, that the lacquered appearance is occasioned by a thick, glutinous, reddish juice, which exudes from every part of the pileus and stipes, and soon dries. No species, perhaps, is so changeable in the characters of the pileus and stem, not even excepting *P. squamosus*, already figured in this work. A plant of it found by RICHARD COTTON, Esq. of Claverley, is described by Mr PURTON as imbricated, with a variously branched or lobed pileus, some of the lobes much elongated, forming pilei of circular, and others more or less of a semicircular figure.

Fig. 1. *P. lucidus.* Fig. 2. *Section of Pileus and Stipes,* natural size. Fig. 3. *Pores.* Fig. 4. *Transverse section of Pores, shewing the Thecæ;* magnified.





OSCILLATORIA RUPESTRIS.

Rock Oscillatoria.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila muco communi matricali involuta, rigida, elastica, oscillantia, striis parallelis transversis secta.—AGARDH.

Filaments invested by a common mucous matrix, rigid, elastic, oscillating, divided by parallel transverse striæ.

SPECIFIC CHARACTER.

OSCILLATORIA rupestris; *filis crassis, flexuosis, æruginosis, limbo albo pellucido, in stratum densum, sordide æruginoso-viridum laxe intertextis.*

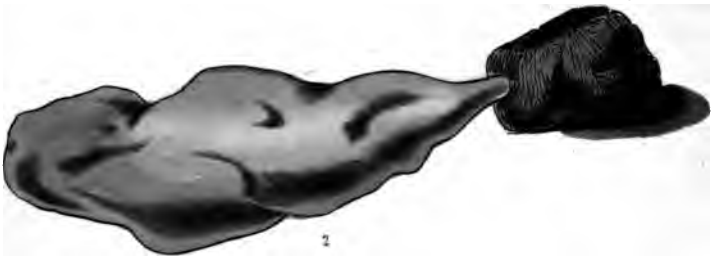
O. filaments thick, flexuose, æruginose, with a white pellucid limb, loosely interwoven, in a dense, dull æruginose-green stratum.

HAB. On the perpendicular sides of rocks, exposed occasionally to the trickling of water. Pentland Hills. May.

Plant covering the face of the rock for several inches together, and, when old, peeling off in rather large pieces. Externally it is mostly of a dull, and often brownish-green colour, but within, more or less of a verdigris-green, differing in intensity in different parts: here and there gelatinous and semitransparent. *Filaments* thick for their length, very flexuose, with a pellucid colourless limb, equal in breadth to the coloured, striated portion, which is of a pale verdigris-green. *Striæ* rather indistinct, not half as long as they are broad.

To the best of my knowledge, the present species of *Oscillatoria* has not found a place in any publication. Its thick and flexuose filaments, and the broad limb with which they are provided, seem to characterise it sufficiently.

Fig. 1. *O. rupestris*, natural size. Fig. 2. *A portion removed.* Fig. 3. *Filaments.* Fig. 4. *Portion of a filament*;—magnified.



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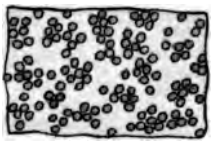

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PALMELLA HYALINA.

Green pellucid Palmella.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Gelatina hyalina, expansa vel globosa, granulis discretis globosis vel ellipticis farcta.—AGARDH.

A hyaline gelatinous receptacle, spreading or globose, filled with distinct globular or elliptical granules.

SPECIFIC CHARACTER.

PALMELLA hyalina; *fronde globoso vel subelongato, hyalino-viridescente, granulis globosis viridibus.*

P. frond globose, or somewhat elongated, pellucid, green; the granules globose, green.

PALMELLA hyalina, *Lyngb. Hydrophyt.* p. 204. t. 69.—*Moug. et Nestl. St. Exsicc.* No. 800.—*Agardh, Syst. Alg.* p. 13.

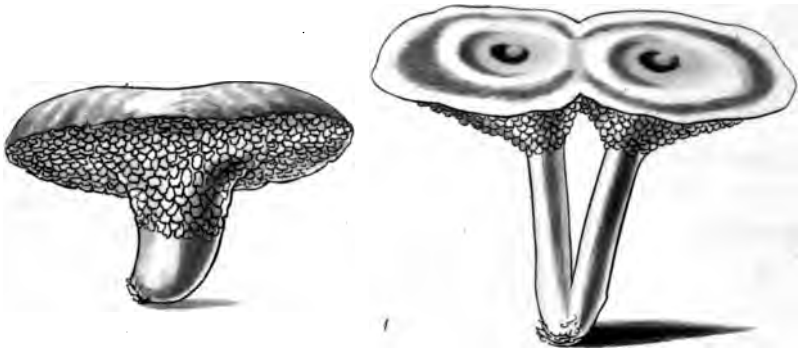
HAB. In fresh-water streams. Pentland Hills, April and May.

Frond from a quarter of an inch to 1 inch in diameter, somewhat globose, but at length frequently more or less elongated into an ovate or even cylindrical form. *Substance* gelatinous and very tender, of a pellucid watery appearance. *Granules* numerous, globose, green. The fronds are produced at first on rocks and stones at the bottom of streams, and afterwards become disengaged, and float on the surface.

This is one of the largest species of the genus, and probably rare, as it has only recently been noticed on the Continent. It is new to the British Flora.

After the frond has lost its regular form, it is rather difficult to recognize. If the specimen be large, it becomes torn, as it were, by its own weight; and even before breaking from its attachment, I have seen it lengthened out, by lesion of its parts, three or four inches.

Fig. 1. *P. hyalina.* Fig. 2. *A plant lengthened out, by growing in a rather rapid stream,* natural size. Fig. 3. *Portion of a frond, with granules;*— magnified.



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SISTOTREMA CONFLUENS.

Confluent Sistotrema.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT ORD. *FUNGI, Link.*

GENERIC CHARACTER.

Hymenium subulis explanatis, lamelluliformibus, flexis et gyrosis, utrinque ascigeris, instructum.—Pileus carnosus.

Hymenium furnished with flat tooth-like processes, in the form of little lamellæ, curved and gyrose; each side producing cells of sporidia.—Pileus fleshy.

SPECIFIC CHARACTER.

SISTOTREMA confluens.

SISTOTREMA confluens, *Pers. Disp. Meth. Fung.* p. 28.—*Syn. Fung.* p. 551.—*Alb. et Schwein.* p. 260.—*Swartz, in Vet. Ac. Handl.* 1810, p. 239.—*Schwein. Fung. Carol.* No. 946.—*Fries. Syst. Mycol.* v. 1. p. 426.—*Syst. Orb. Veg.* 1. p. 81.—*Grev. Fl. Edin.* p. 405.

HYDNUM sublamellosum, *Bull. Champ.* p. 306. t. 453. f. 1.—*Soiv. Fung.* t. 112.—*De Cand. Fl. Franç.* v. 2. p. 112.—*Ejusd. Syn.* p. 23.

HAB. Woods and Fir plantations, on the ground, and on sticks. Autumn. Not common. Foxhall, Captain WAUCH.—In England, I believe it has been found only by the Rev. CHARLES ABBOTT of Bedford, from whose specimens Mr SOWERBY made his drawing.

Gregarious, often confluent (several growing into each other), scentless, brittle, whitish, at length yellowish, and more or less tinged with reddish-brown. *Stipes* half an inch or less to an inch in height, variable in thickness, attenuated at the base, central or lateral, horizontal or even vertical, according to circumstances, rarely wanting. *Pileus* generally somewhat more than an inch in breadth, depressed; the margin sometimes lobed, and often irregular, from the propensity of the pilei to coalesce. *Processes of the hymenium* whitish, distinct, thin, entire or laciniate, curved or gyrose, never forming pores; producing fructification on both sides. *Sporidia* globose, often adhering in little clusters to the extremities of the processes.

Of the species formerly referred to the genus *Sistotrema*, FRIES has retained only the one now described. He observes

that it is intermediate between the *Agarici* and the *Hydna*, and has a strong analogy with some *Dœdaleæ*, but differs in the hymenium being always destitute of real pores, whether regular or irregular. Most of the other species of *Sistotrema* of PERSOON are placed under *Hydnum* in the Systema Mycologicum.

In a new, laborious and learned work just published by M. FRIES, the genera of the *Fungi*, as well as those of the *Lichens* and *Algæ*, are carefully revised, and many new ones proposed. In a subordinate division of the large group of Pileate Fungi, or those whose Hymenium is inferior and ascigerous, we find the genus *Hydnum* and its allies arranged together, with the character, " Hymenium subulatum vel tuberculatum ;" and the following genera are enumerated, two of them being new :

FISTULINA, *Bull.*—Subulæ a pileo discretæ, demum tubuloso-apertæ.
HYDNUM, *Linn.*—Subulæ confertæ, liberæ, clausæ.
SISTOTREMA, *Fries.*—Subulæ explanatæ, flexæ, lamelliformes vel characteriformes.
IRPEX, *Fries.*—Subulæ irregulares, basi seriato vel reticulato-conjunctæ. —*Pileus dimidiatus vel resupinatus.*
RADULUM, *Fries.*—Hymenium interruptum, hinc inde tuberculosum.

The last connects the hydnoid group with the *Thelephoræ*.

Fig. 1. *S. confluens.* Fig. 2. *A confluent group, and young plants.* Fig. 3. *A section of a distinct plant ;* natural size. Fig. 4. *Tooth-like processes of the hymenium.* Fig. 5. *Sporidia ;* magnified.

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AGARICUS LACCATUS.

Mealy Agaric.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link.*

SERIES I. TRIBE VIII. CLITOCYBE.—SECT. IV. OEDYPUS, *Fries.*

GENERIC CHARACTER.

Pileus stipitatus aut latere affixus, subtus lamellis sporiferis, rectis, simplicibus. Volva nulla.

Pileus furnished with a stipes, or fixed by its side: bearing on the under surface, straight simple, sporuliferous lamellæ. Volva none.

SPECIFIC CHARACTER.

AGARICUS laccatus; *gregarius; pileo subcarnoso, tenaci, squamuloso, expallente, dein disco depresso; lamellis crassis, subdecurrentibus, distinctis, distantibus, stipite tenaci fistuloso elongato.*

Obs. gregarious; pileus somewhat fleshy, firm, minutely scaly, becoming pale, and the disk depressed; lamellæ somewhat decurrent, thick; distinct, remote, the stipes hollow, firm, elongated.

AGARICUS laccatus, *Scop.* No. 1530.—*Schæff. Fung.* t. 13.—*Fries, Syst. Mycol.* v. 1. p. 107.—*Grev. Fl. Edin.* p. 377.

AGARICUS farinaceus, *Huds. Fl. Angl.* p. 616.—*Bolt. Fung.* t. 64.—*Pers. Syn. Fung.* p. 453.—*Sow. Fung.* t. 208.—*Sibth. Fl. Oxon.* No. 984.—*Relh. Fl. Cant.* ed. 3. p. 531.—*Alb. et Schwein.* p. 219.—*With. Bot. Arr.* ed. 6. v. 4. p. 292.—*Purt. Midl. Fl.* v. 2. p. 640.—*Fl. Dan.* t. 1249.—*Hook. Fl. Scot.* Pt. 2. p. 23.—*Schwein. Fung. Carol.* No. 770.

AGARICUS amethysteus, *Bull. Champ.* t. 570. f. 1. et t. 198.—*Pers. Syn. Fung.* p. 465.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 172.—*Ejusd. Syn. Fung.* p. 35.—*Alb. et Schwein.* p. 222.—*Schwein. Fung. Carol.* No. 786.

AGARICUS amethystinus, *Huds. Fl. Angl.* p. 612.—*Bolt. Fung.* t. 63.—*Sow. Fung.* t. 187.—*Fl. Dan.* t. 1250.—*Rehl. Fl. Cant.* p. 524.—*Sibth.* No. 983.—*With. Bot. Arr.* v. 4. p. 229.—*Purt. Midl. Fl.* v. 2. p. 628.—*Hook. Fl. Scot.* Part 2. p. 20.—*Grev. Fl. Edin.* p. 378.

AGARICUS livido-purpuraceus, *With. Bot. Arr.* v. 4. p. 320.

AGARICUS rosellus, *Batsch. Elench. Fung. Cont.* 1. p. 123. t. 19. f. 99.—*With. Bot. Arr.* v. 4. p. 219.

AGARICUS subcarneus, *Batsch.* l. c. t. 19. f. 100.

AGARICUS carneus, *Schæff. Fung.* t. 303.

AGARICUS rubellus, *Schæff.* l. c. t. 304.

HAB. On the ground, in woods and moist shady places. Summer and autumn. Common.

Plant gregarious, sometimes almost fasciculate. *Pileus* from one to two inches in breadth, flesh-colour, reddish, pink-brown, or fine violet, darker and striated in a moist state, in dry weather becoming pale; convex, or even somewhat campanulate, becoming depressed in the centre, at length sometimes nearly plane, or even curled upwards at the margin: margin irregular, often undulate: surface rough, with minute scales. *Lamellæ* flesh-colour or violet, broad, thick, distant, brittle, 2–4 in a set, sometimes forked, slightly decurrent, at length whitish and farinose. *Flesh* very thin, the colour of the pileus. *Stipes* 3–6 inches in length, 3–4 lines in thickness, somewhat fibrous, firm, hollow, crooked, generally slightly thickened at the base, flesh-colour or violet.

There are few fungi in which different colours prevail so decidedly as in the present species. One variety is found so uniformly of a flesh colour, and another of a fine purple, that botanists have usually agreed in keeping them distinct; yet the resemblance in other respects has generally been remarked. My friend Mr PURTON long ago anticipated that they would be united; and so we accordingly find them in the Systema Mycologicum. When specimens of each are preserved, it is very difficult to find any difference whatever. The few peculiar marks whereby the violet-purple variety is distinguished, are the colour, a somewhat more solitary mode of growth, and the stipes rather inclined to be attenuated towards the base than thickened.

Figures in different states,—all the natural size.

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ERINEUM FAGINEUM.

Beech Erineum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Grev.*

GENERIC CHARACTER.

Peridia flocciformia, subdiaphana, varia, subsimplicia, aggregato-cæspitosa, foliis vivis parasitica. Sporulæ minutissimæ sæpissime nullæ.

Peridia flocciform, subdiaphanous, various, subsimple, aggregato-cæspitose, parasitic on living leaves. Sporules exceedingly minute, very often wanting.

SPECIFIC CHARACTER.

ERINEUM fagineum; *hypophyllum, maculiforme, subimmersum, granulosum, densum, primo albidum, demum badium; peridiis turbinato-clavatis.*

E. hypophyllous, spot-like, somewhat immersed, granulose, dense, at first white, at length rich brown; peridia clavate, turbinate.

ERINEUM fagineum, *Pers. Ob. Myc.* 2. p. 102.—*Syn. Fung.* p. 700.—*Mycol. Europ.* 1. p. 8.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 592.—*Ejusd. Syn.* p. 15.—*Rebent. Fl. Neom.* p. 396.—*Schultz, Fl. Starg.* p. 505. *fide Kunze.*—*Alb. et Schwein.* p. 370.—*Hoppe, Exsicc. Fung. Epiph.* 1. No. 9.—*Deutschl. Schw.* 2. No. 50.—*Funck, Crypt. Gew.* 10. No. 224.—*Moug. et Nestl. St. Exsicc.* 1. No. 97.—*Grev. in Edinb. Phil. Journ.* v. 6. p. 80. t. 3. f. 10.—*Kunze, Mycol. Hefte.* 2. p. 141.

ERINEUM lactcum, *Fries, Obs. Mycol.* 2. p. 371.

RUBIGO faginea, *Nees, Syst.* p. 64. t. 5. f. 63.—*Martius, Fl. Crypt. Erlang.* p. 347.

HAB. On the inferior surface of the leaves of the Beech *(Fagus sylvatica)*, in summer. Frequent.

Plant forming mostly distinct spots on the under surface of the leaves, sometimes confluent, minute, granulose, densely crowded, slightly immersed in a hollow of the leaf; when young whitish, at length purplish and rich brown. *Peridia* clavate, and more or less turbinate.

A beautiful carmine-purple variety of this species occurs on the Continent, and especially in Switzerland, and is mentioned by DE CANDOLLE, PERSOON, and KUNZE. The ordinary state of it has been recently discovered in various parts of England; and I have noticed it in many places in Scotland. Mr BAXTER of Oxford communicated fine specimens to me last year (1825).

Fig. 1. a, *E. fagineum;* natural size. b, *Peridia;* magnified.

ERINEUM POPULINUM.

Poplar Erineum.

SPECIFIC CHARACTER.

ERINEUM populinum; *amphigenum, maculiforme, profunde immersum, laxum, primo pallidum, dein rufescens, demum sordide spadiceum; peridiis opacis, crassis, irregularibus, apice subramosis, erosis.*

E. on both sides of the leaf, spot-like, deeply sunk, lax, at first pale, then reddish, at length dark purplish-brown; peridia opake, thick, irregular, somewhat divided and erose at the summit.

ERINEUM populinum, *Pers. Obs. Mycol.* 1. p. 100.—*Syn. Fung.* p. 700.—*Mycol. Europ.* 1. p. 7.—*De Cand. Fl. Franç.* v. 6. p. 14.—*Syn. Fl. Gall.* p. 15.—*Alb. et Schwein.* p. 371.—*Schultz, Fl. Starg.* p. 505. *fide Kunze.*—*Fries, Obs. Mycol.* 1. p. 223.—*Funck, Crypt. Gew.* 7. No. 165.—*Deutschl. Schwaem.* 1. No. 99.—*Moug. et Nestl. St. Exsicc.* 1. No. 100.—*Grev. in Edinb. Phil. Iourn.* v. 6. p. 78. t. 3. f. 11.—*Purt. Midl. Fl.* v. 3. p. 315.—*Kunze, Mycol. Heft.* 2. p. 148.

ERINEUM aureum, *Schum. Fl. Sæl.* 2. p. 446.

RUBIGO populina, *Mart. Fl. Crypt. Erl.* p. 348.

HAB. On both sides of the leaves of Poplars *(Populi)*, especially *Populus tremula*. Summer and autumn, not unfrequent. Darnway woods, and other places in Scotland. I had the pleasure of receiving English specimens in 1825 from Mr BAXTER of the Botanic Garden, Oxford.

Plant forming distinct spot-like groups, deeply immersed in hollows of the leaf, of a deep purplish-brown colour when mature. *Peridia* short, thick, somewhat opake, dividing at the top into a number of little projections, which give them an erose somewhat capitate appearance.

A species distinctin its very dark colour, deeply immersed groups, and remarkably irregular peridia.

Fig. 2. a, *E. populinum*, natural size. b, *Peridia;* magnified.

UREDO CANDIDA.

White Uredo.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *EPIPHYTÆ, Link.*

GENERIC CHARACTER.

Sporidia simplicia, nuda, libera, sub epidermide foliorum coacervata, et epidermide rupta, facile dispersa.

Sporidia simple, naked, free, collected together beneath the epidermis of leaves, and easily scattered when the epidermis is ruptured.

SPECIFIC CHARACTER.

UREDO candida; *polymorpha, candida, sporidiis copiosis sphæricis.*

U. polymorphous, white, the sporidia plentiful, spherical.

UREDO candida, *Pers. Syn. Fung.* p. 223.—*Alb. et Schwein.* p. 129.—*De Cand. Fl. Franç.* v. 6. p. 88.—*Moug. et Nestl. St. Exsicc.* No. 190.—*Rebent. Fl. Neom.* p. 356.—*Strauss, in Act. Wetterav.* v. 2. p. 85.—*Schwein. Fung. Carol.* No. 481.—*Hook. Fl. Scot.* Part 2. p. 15.—*Grev. Fl. Edin.* p. 442.

UREDO cruciferarum, *De Cand. Fl. Franç.* v. 2. p. 596.—*Ejusd. Syn.* p. 4.—*Moug. et Nestl.* l. c. No. 86.—*Schmidt et Kunze, Deutschl. Schwaem.* No. 86.

UREDO Tragopogi, *De Cand. Fl. Franç.* v. 2. p. 237.—*Ejusd. Syn.* p. 49.

UREDO inaperta, *De Cand.* l. c. p. 237.

UREDO Petroselini, *De Cand. Syn. Fl. Gall.* p. 49.

UREDO Thlaspi, *Sow. Fung.* t. 340.—*With. Bot. Arr.* ed. 6. v. 4. p. 481.—*Purt. Midl. Fl.* v. 3. p. 296. in part.

RETICULARIA Thlaspi, *Rehl. Fl. Cant.* ed. 3. p. 568.

CÆOMA candidum, *Nees, Syst.* t. 1. f. 8.

CÆOMA UREDO candida, *Mart. Fl. Erlang.* p. 316.

ÆCIDIUM candidum, *Gmel. Syst. Nat.* 2. p. 1473.

HAB. On the leaves, stalks, and even seed-vessels, of many *Cruciferæ*, or Tetradynamous plants, rarely on plants of other classes. Summer. Very abundant.

Plant of a very white hue, attacking the stalks, leaves, calyx, and even seed-vessel, at its first appearance distinct, afterwards often confluent; sometimes growing in clusters in a circular manner, very irregular in form, being much influenced by the structure of the part on which it grows. In most cases, the epidermis is very late in bursting, and sometimes appears never to do so at all. *Sporidia* spherical, very numerous, white, diaphanous under the microscope.

The white Uredo can scarcely have escaped the observation of any one interested in the vegetable productions of nature. On the Shepherd's Purse, so common by road-sides, it is to be found throughout the greater part of the spring and summer, variegating the leaves with its white spots, and often distorting the flowering-stems. In gardens it is more conspicuous, for it often attacks the cabbage and the cauliflower, or other varieties of *Brassica oleracea*, forming large blotches on the leaves, each composed of many irregular spreading spots or clusters of sporidia, whose white colour forms a strong contrast to the dark green hue of the plant.

On the Shepherd's Purse, the *Uredo candida* forms a nidus for another parasite, the *Botrytis parasitica* of PERSOON, —a little plant which has been confounded by some writers with the uredo itself, but to which it bears no resemblance.

It is rather doubtful whether there be more than one species of white Uredo. DE CANDOLLE thought differently at one period, but seems to have satisfied himself that one only is known, in the supplementary volume to the Flore Française. The *Uredo Cheiranthi* of PERSOON, is, however, said by M. SCHWEINITZ to be really distinct. It is a species I have not seen.

Fig. 1. *U. candida, on Thlaspi Bursa-pastoris.* Fig. 2. *The same on a portion of a Cabbage leaf,* natural size. Figs. 3. & 4. *Plants of the same.* Fig. 5. *Sporidia;* magnified.

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PERICHÆNA POPULINA.

Poplar Perichæna.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Link.*

GENERIC CHARACTER.

Peridium papyraceum, regulare, persistens, simplex, læve, demum circumcissum. Flocci rari, immixti liberi.

Peridium papyraceous, regular, persistent, simple, even, at length bursting transversely into two portions. Filaments few, free, lying among the sporidia.

SPECIFIC CHARACTER.

PERICHÆNA populina; *gregaria, peridiis globosis, luteo-fuscis, nitidis, sporidiis luteis.*

P. gregarious; peridia globose, yellow-brown, shining, the sporidia yellow.

PERICHÆNA populina, *Fries, Symb. Gast.* p. 12. et Char. Gen. *Syst. Orb. Veg.* Pars 1. p. 141.

LICEA circumscissa, *Pers. Syn. Fung.* p. 196.—*Alb. et Schwein.* p. 108.—*De Cand. Fl. Franç.* v. 2. p. 249.—*Ejusd. Syn.* p. 55.—*Schwein. Fung. Carol.* No. 417.—*Hook. Fl. Scot.* Pt. 2. p. 13.—*Grev. Fl. Edin.* p. 451.

TRICHIA gymnosperma, *Pers. Obs. Mycol.* 1. p. 63. t. 6. f. 1,–2.

SPHÆROCARPUS subsessilis, *Bull. Champ.* t. 417. f. 5.—*Sow. Fung.* t. 258.?

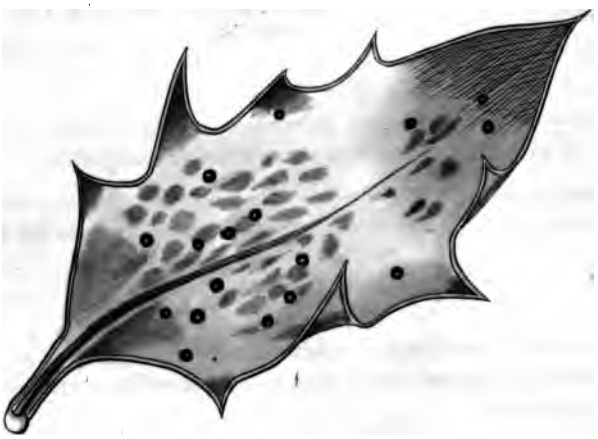
HAB. Trunks of decaying trees, chiefly between the wood and the bark, especially on the Aspen *(Populus tremula)*. Frequent in Spring and Autumn.

Peridia crowded, as large as the head of a small pin, of a yellow-brown, or pale chesnut colour, smooth, even, globose, somewhat shining, of a very delicate and fragile texture, bursting transversely in the middle, so that the upper half falls off like a lid. *Sporidia* bright yellow, copious, spherical, intermixed with a very few slender filaments.

The genus *Perichæna*, now illustrated for the first time in this work, was established by my excellent friend M. FRIES in his Symbolæ Gasteromycorum, published in 1817; and he has again introduced its character in his very learned and laborious Systema Orbis Vegetabilis, of which the first part appeared in

1825. *Perichæna* is most nearly allied to *Lycogala* and *Licea*. From the former it differs in its simple peridium; for FRIES considers the true *Lycogalæ* to have a double peridium, the outer one passing away into warts, while the inner one remains entire and bursts at the apex. From *Licea* it differs in having filaments lying among the sporidia. It likewise differs from both *Lycogala* and *Licea* in bursting horizontally into two regular portions. Both the figures of BULLIARD and SOWERBY furnish a very imperfect representation of our plant. That of BULLIARD is almost black, and that of SOWERBY not only much too dark, but of an oval figure. I cannot but entertain a strong suspicion that the latter is another plant; and therefore, that British authors who have followed SOWERBY are unacquainted with the true *Perichæna populina*. It is possible, however, that the var. β of ALBERTINI and SCHWEINITZ may have been mistaken for it. This is described as a distinct species by FRIES, "*P. abietina*, hypothallo fucescenti, peridiis badionigris, sporidiis luteis;" and it is not unlikely the subjacent membrane may have been overlooked.

Fig. 1. *P. populina*, natural size. Fig. 2. *A group of plants.* Fig. 3. *Sporidia and filaments;* magnified.



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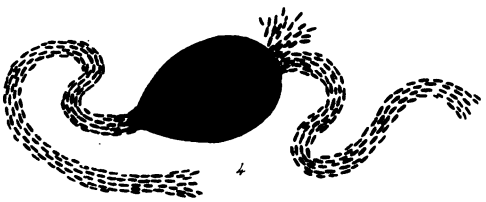

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CEUTHOSPORA PHACIDIOIDES.

Large shining Ceuthospora.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *HYPOXYLA, De Cand.*

GENERIC CHARACTER.

Perithecium cellulare, innatum, astomum, demum irregulariter dehiscens, nucleum atrum includens. Sporidia e nucleo dissoluto erumpentia.

Perithecium cellular, innate, mouthless, at length irregularly dehiscent, containing a black nucleus. Sporidia escaping from the dissolving nucleus.

SPECIFIC CHARACTER.

CEUTHOSPORA phacidioides; *orbicularis, plana, nigra, nitida, peritheciis demum in lacinias pallidas, breves, 3–5 dehiscentibus; sporidiis cylindraceis, erumpentibus.*

C. orbicular, plane, black, shining, the perithecia bursting at length by 3–5 short pale segments; sporidia somewhat cylindrical, escaping.

PHACIDIUM multivalve, *Schmidt, Myc. Heft.* 1. p. 42.—*Fries. Syst. Mycol.* v. 2. p. 576.—*Moug. et Nestl. St. Exsicc.* No. 560.

XYLOMA multivalve, *De Cand. Fl. Franç.* v. 2. p. 303.—*Ejusd. Syn.* p. 63.—*Mem. du Mus.* v. 3. p. 324. t. 3. f. 8.—*Poir. Dict.* v. 8. p. 808.

SPHÆRIA Hederæ (*Fries*) var. β Ilicis, *Nees, et F. Nees ab Esenb. Pl. Mycet.* p. 30. t. 2. f. 53.

SPHÆRIA bifrons, *Sow. Fung.* t. 316.—*Relh. Fl. Cant.* p. 573.—*Purt. Midl. Fl.* v. 2. p. 714.

CRYPTOSPHÆRIA? bifrons, *Grev. Fl. Edin.* p. 361.

HAB. On the dead leaves of the Holly (*Ilex aquifolium*), frequent at all seasons.

Perithecia scattered or gregarious, nearly a line in breadth, adnate with the epidermis, very black, shining, plane or slightly convex, so completely innate as to occupy both surfaces of the leaf, dark brown within; the centre of the perithecium at length opens by 3–5 acute, somewhat regular, short segments, which become almost erect. Within the cellular perithecium are 3–5 ovate, blackish masses or nuclei, composed entirely of *sporidia*, and which, under favourable circumstances, dissolve, and discharge the sporidia by the opening of the perithecium. The sporidia are whitish, and as they escape from each nucleus, form a kind of orifice for themselves, those at first protruded serving for a mar-

gin, while the remainder constantly following, keep the passage open. Sometimes the sporidia force an opening on both the upper and under surface of the perithecium.

Of the genus *Ceuthospora*, proposed in the Systema Orbis Vegetabilis, FRIES has remarked, that an analysis of many of the species is still required, in order to furnish a satisfactory character. I have endeavoured in part to supply this desideratum, by the description of the present and the following plants, both of which I believe must be considered species of *Ceuthospora*.

The plant now figured has perplexed many botanists. DE CANDOLLE described it as a *Xyloma*, and SCHMIDT, from its habit, as a *Phacidium;* but it has no real *asci*. In a careful analysis of perfect specimens, the internal structure is sufficiently evident, and has been partly illustrated by MM. NEES, and F. NEES VON ESENBECK. The main substance of the perithecium is solid and homogeneous, like that of a *Sclerotium;* but towards the centre are 3–5 ovate, distinct masses or *nuclei*, of a darker colour, which may be removed from the perithecium. If one of these masses be moistened, the sporidia, mixed with a mucilaginous fluid, are propelled in streams, as it were by some internal force. *Sclerotium inclusum*, SCHMIDT and KUNZE, and *Sphæria phæocomes*, REB. (*Cryptosph. capillata*, GREV.) belong to this genus. The latter, I regret to find, I have figured in a young state, before the black nucleus was visible.

Fig. 1. *Ceuthospora phacidioides*, natural size. Fig. 2. *Two perithecia, one of them dehiscent, and exhibiting two rounded orifices formed by the flowing of the sporidia.* Fig. 3. *A perithecium divided, shewing the internal nuclei beginning to dissolve into sporidia.* Fig. 4. *One of the nuclei propelling the sporidia in streams, as takes place on the application of moisture;* magnified.

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CEUTHOSPORA Lauri.

Laurel Ceuthospora.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat Ord. *HYPOXYLA, De Cand.*

GENERIC CHARACTER.

Perithecium cellulare, innatum, astomum, demum irregulariter dehiscens, nucleum atrum includens. Sporidia e nucleo dissoluto erumpentia.

Perithecium cellular, innate, mouthless, at length irregularly dehiscent, containing a black nucleus. Sporidia escaping from the dissolving nucleus.

SPECIFIC CHARACTER.

Ceuthospora Lauri; *sparsa vel gregaria; perithecio innato, rufescente-nigro, obtuse conico, demum in lacinias 3–4, acutas, erectas, dehiscenti; nucleo solitario, sporidiis cylindricis.*

C. scattered or gregarious perithecium innate, reddish-black, obtusely conical, at length bursting by 3–4 acute, erect, segments; nucleus solitary, the sporidia cylindrical.

Sphæria Lauri, *Sow. Fung.* t. 371. f. 4.
Sphæria Hederæ, β Lauri, *Fries, Syst. Mycol.* v. 2. p. 521.
Cryptosphæria Lauri, *Grev. Fl. Edin.* p. 361.

Hab. On the dead leaves of the Common Laurel *(Laurus nobilis)* at all seasons. Very frequent.

Perithecia scattered or gregarious, innate, and incorporated with the epidermis on both sides of the leaf, reddish-black, plane at the margin, but becoming obtusely conical towards the centre, and paler at the apex, where they burst at length into 3 or 4 acute, erect segments. Within is a solitary nucleus of a dark colour, which, on the application of moisture, dissolves into a prodigious number of minute cylindrical sporidia. In escaping from the perithecium, the sporidia form to themselves a kind of marginal orifice, as in *Ceuthospora phacidioides.*

This plant, first published by Sowerby from specimens communicated by Mr Kirby, has not been taken up by other British writers; and in Withering's Arrangement especially,

it shares the fate of between eighty and ninety of SOWERBY's *Sphæriæ*. On the Continent, I can only find it noticed by FRIES, who quotes it as a variety of *Sphæria Hederæ*, from which I think he will now agree that it is distinct.

Fig. 1. *C. Lauri*, natural size. Fig. 2. *Two perithecia; one of them dehiscent.* Fig. 3. *A perithecium divided.* Fig. 4. *The nucleus removed, and dissolving into sporidia;* magnified.

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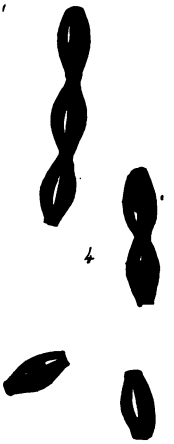

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MONILIA ANTENNATA.

Black crowded Monilia.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ, Grev.*

GENERIC CHARACTER.

Flocci opaci, articulati, erecti, liberi, articulis contiguis.

Flocci opake, jointed, erect, free, the joints contiguous (not interrupted).

SPECIFIC CHARACTER.

MONILIA antennata; *floccis simplicibus, densissime aggregatis, moniliformibus, articulis ovalibus.*

M. flocci simple, very densely crowded, moniliform, the joints oval.

MONILIA antennata, *Pers. Syn. Fung.* p. 694.—*Alb. et Schwein.* p. 365.—*Schwein. Fung. Carol.* No. 1322.—*Nees, Syst. Myc.* t. 5. f. 67.—*Mart. Fl. Crypt. Erl.* p. 356.—*Brong. Class. nat. Champ.* t. 2. f. 5.

TORULA antennata, *Pers. Myc. Europ.* 1. p. 21.

DEMATIUM antennæforme, *Hoffm. Fl. Germ.* 2. t. 13. f. 4.

HAB. On wood, and the trunks of dead trees; not unfrequent in autumn. I have received fine specimens from Captain CARMICHAEL, who finds it at Appin.

Plant spreading in dense black patches, an inch or more in breadth. *Filaments* erect, very crowded, not half a line in height, simple, opake, rigid, jointed, the *joints* oval or elliptical, resembling the beads of a necklace, containing in the centre of each an obscure granulated mass *(Sporidia?)*

It is rather singular that it should fall to my lot to record *Monilia antennata* as a British plant, common as it certainly is in every part of the country.

Monilia is placed by FRIES in his Systema Orbis Vegetabilis among his *Byssaceæ*, a large group or family situated, according to him, between the Lichens and the *Algæ*, and perhaps correctly. He regards the *Byssaceæ* as aërial *Algæ*: "Algæ aëreæ, perennantes, continuo vigentes, contextu filamentoso, fibris farctis (liberis aut pluribus conglutinatis, cortice

communi), immutatis persistentibus ; fructificatione homogenea, extus nuda nascente." He observes, that they differ in many respects from the *Mucedines* or filamentous Fungi, with which they have been confused; especially in being persistent, indefinite in their manner of growth, of a solid substance, rigid texture, and modes of reproduction. In this family we find the well known genera:—*Rhizomorpha*, *Periconia?* *Ozonium*, *Hypochnus*, *Myxotrichum*, *Racodium*, *Helmisporium*, *Oidium*, *Torula*, &c. &c. besides several new genera. *Lichina*, Ag. is also included by the learned author, at least *L. confinis*; *L. pygmæa* being considered a true *Alga*. Having, however, studied both species of *Lichina* very recently, I cannot refrain from expressing my opinion that they are both *Algæ*, and really species of the same genus, their general structure being the same, and their fructification remarkably similar.

In examining the present species of *Monilia*, I noticed a dark granulated mass within some of the joints, which I at first conjectured might be very minute sporidia. After my drawing was finished, I observed, on consulting Dr Martius's Flora Cryptogamica Erlangensis, that he had remarked a similar appearance: " Fibræ —— articulis ovatis, intus massam opacam demum grumosam continentibus, (quasi sporis)."

Persoon, in his Mycologia Europæa, comprehends under his *Monilia* the genera *Aspergillus* and *Polyactis* of Link; and our *Monilia* he has united to *Torula*.

Fig. 1. *M. antennata*, natural size. Fig. 2. *Filaments.* Figs. 3. & 4. *Filaments, some of the joints separating at the articulations, and shewing a dark mass within;* magnified.

AURICULARIA REFLEXA.

Reflexed hairy Auricularia.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link.*

GENERIC CHARACTER.

Hymenium cum pileo homogeneum et concretum, undique fructificatione obsitum, læviusculum. Asci immersi. Sporidia solitaria, albida.

Hymenium of the same substance, and not distinct from the pileus, even. Asci immersed. Sporidia solitary, white.

SPECIFIC CHARACTER.

AURICULARIA reflexa; *effuso-reflexa, coriacea, strigoso-hirsuta, zonata, hymenio glabro lævi lutescenti.*

A. effuso-reflexed, leathery, strigose, zoned, the hymenium glabrous, even, yellow.

AURICULARIA reflexa, *Bull. Champ.* p. 282. t. 274.—*Sow. Fung.* t. 27.—*With. Bot. Arr.* ed. 6. v. 4. p. 412.—*Rehl. Fl. Cant.* ed. 3. p. 553.—*Sibth. Fl. Ox.* p. 384.—*Winch, Bot. Guide,* v. 2. p. 99.—*Purt. Midl. Fl.* v. 2. p. 680, *Fries, Syst. Orb. Veg.* 1. p. 83. sub char. gen.

AURICULARIA aurantiaca, *Schum. Fl. Sæll.* p. 398.

THELEPHORA reflexa, *De Cand. Fl. Franç.* ed. 3. v. 2. p. 105.—*Ejusd. Syn.* p. 21.

THELEPHORA hirsuta, *Willd. Ber.* p. 397.—*Pers. Syn. Fung.* p. 570.—*Myc. Europ.* 1. p. 116.—*Alb. et Schwein.* p. 274.—*Hook. Fl. Scot.* Pt. 2. p. 29.—*Schwein. Fung. Carol.* No. 1014.—*Fries, Syst. Mycol.* v. 1. p. 439.—*Grev. Fl. Edin.* p. 407.

THELEPHORA papyracea, *Fl. Dan.* t. 1199.

STERCUM hirsutum, *Pers. Obs. Mycol.* 2. p. 90.

BOLETUS auriformis, *Bolt. Fung.* t. 82. f. C.

HELVELLA villosa, *Relh. Fl. Cant.* ed. prior No. 960.

HELVELLA acaulis, *Huds. Fl. Angl.* p. 639.

HELVELLA versicolor, *Liljebl. Sv. Fl.* 2. p. 454. *fide Fries.*

AGARICUS villosus tenuis, inferne lævis, *Ray, Syn.* p. 21.

HAB. On the dead trunks and branches of trees, posts and paling, &c. abundant everywhere, throughout the year.

Plant of a thin, coriaceous, pliable substance when moist, but in a dry state hard, firm, and like cork. In the young state it is effused, and its future form depends a good deal upon the nature of its situation. In a short time it becomes more or less reflexed, and each pileus or plant is either distinct, or crowded and imbricated, or sometimes even growing in a circular

manner, as if provided with a stipes. The surface is woolly, or shaggy with coarse hairs, and impressed with a number of zones of various breadths, and tinged with different colours, according to circumstances; but the general hue is a yellowish-buff. The margin is entire, thin, more or less lobed, the lobes roundish. *Hymenium* mostly yellowish-buff, glabrous, even. *Asci* (little tubes containing the sporidia) immersed. *Sporidia* solitary (on the authority of FRIES), white, difficult to detect.

In his Systema Orbis Vegetabilis, M. FRIES has proposed to restore the old genus *Auricularia* of BULLIARD, and to retain under *Thelephora* only those species which have a somewhat papillose unequal hymenium. They all grow upon the ground, and possess brown quaternate sporidia. The great mass of species will therefore now come under *Auricularia*; which, with its allies, are contained in a suborder of the Pileate fungi, entitled *Auricularini*. Hymenium papillosum vel læve. The genera are as follow:

THELEPHORA, *Ehrh.*—Hymenium subpapillosum, inæquabile. Sporidia quaternata, fusco-purpurea.

AURICULARIA, *Bull.*—Hymenium læviusculum. Asci immersi. Sporidia solitaria albida.

PHLEBIA, *Fries.*—Hymenium vage vel interrupte plicatum. Asci immersi. Sporidia solitaria albida.

CONIOPHORA, *De C.*—Hymenium læviusculum. Asci sub-obliterati. Sporidia ochracea vel subferruginea copiose inspersa.

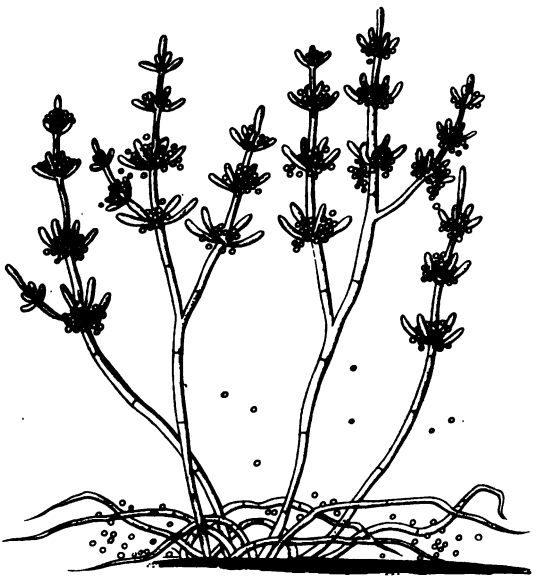
STEREUM, *Link.*—Hymenium læviusculum, ascis? segregatis basi immersis, apicibus emersis.

The two last genera are not yet accurately understood; and their characters are consequently not very well marked.

Auricularia reflexa is of extremely common occurrence, and distinguished by the hairy zoned surface of the reflexed pileus, and very smooth hymenium. Several varieties are described, chiefly characterised by their colour, which may be in part whitish, greyish, reddish, yellow, or brownish.

Figs. 1. & 2. *Auricularia reflexa*, natural size. Fig. 3. *A portion of the pileus.* Fig. 4. *A portion of the hymenium.* Fig. 5. *Asci and sporidia;* magnified.

1



2

STACHYLIDIUM TERRESTRE.

White branched Stachylidium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ, Grev.*

GENERIC CHARACTER.

Flocci fertiles erecti, basi sterilibus implexi; ramuli superne verticillati, breves, obtusi. Sporidia ad verticillos congesta.

Fertile filaments erect, entangled with the sterile ones at the base; the ramuli whorled towards the top, short, obtuse. Sporidia clustered at the whorls.

SPECIFIC CHARACTER.

STACHYLIDIUM terrestre; *flocci ramosi, erecti, albi, sporidiis globosis.*

S. filaments branched, erect, white, the sporidia globose.

STACHYLIDIUM terrestre, *Link, in Bot. Mag.* v. 3. p. 15. t. 1. f. 21.

STACHYLIDIUM candidum, *Grev. in Wern. Trans.* v. 4. p. 72. t. 5. f. 6.—*Fl. Edin.* p. 466.

BOTRYTIS terrestre, *Fries, Myc. Eur.* 1. p. 38.

HAB. On the ground, and on rotten wood. Autumn. Near Edinburgh.

Spreading on the ground, or on rotten wood, for an inch or more together, but in a somewhat scattered manner; of a white colour. *Sterile filaments* decumbent, entangled. *Fertile ones* erect, branched, remotely jointed, attenuated at the base; towards the summit set with several whorls composed of four very short, inflated, obtuse branchlets. Sometimes one of the branchlets elongates into a branch, and then becomes whorled like the rest. *Sporidia* small, globose, aggregated at each whorl.

Stachylidium is a very pretty little genus established by the eminent Professor LINK, in the 3d volume of the Berlin Magazine; and though it has been reduced by PERSOON, it is supported by Professor NEES AB ESENBECK, by M. ADOLPHE BRONGNIART, in his "Classification naturelle des Champignons," in the Dictionnaire des Sciences Naturelles, and, lastly, by M. FRIES in his new work, the Systema Orbis Vegetabilis. With such authorities on my side, I have not he-

sitated to keep *Stachylidium* distinct from *Botrytis*. It ought to be mentioned, however, that Professor LINK himself has questioned the validity of the genus, in a paper in the 7th volume of the Berlin Magazine, but without any additional observations.

Fig. 1. *Stachylidium terrestre*, natural size. Fig. 2. *Filaments*, magnified.

CANTHARELLUS CIBARIUS.

Edible Cantharellus.—Chantarelle.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT ORD. *FUNGI, Link.*

GENERIC CHARACTER.

Pileus hymenio inferiori. Lamellæ plicæformes, dichotomæ, subinde obsoletæ. Pileus carnosus vel membranaceus.

Pileus with the hymenium inferior. Lamellæ in the form of dichotomous (sometimes obsolete) folds. Pileus fleshy or membranaceous.

SPECIFIC CHARACTER.

CANTHARELLUS cibarius; *vitellinus, pileo carnoso, subrepando, glabro, plicis tumidis, stipite solido, deorsum attenuato.*—FRIES.

C. buff-yellow, the pileus fleshy, somewhat repand, glabrous, the folds tumid; stipes solid, attenuated downwards.

CANTHARELLUS cibarius, *Fries, Syst. Mycol.* v. 1. p. 318.—*Grev. Fl. Edin.* p. 396.—*Wern. Trans.* v. 4. p. 368.

MERULIUS Cantharellus, *Pers. Syn. Fung.* p. 488.—*Alb. et Schwein.* p. 233.—*De Cand. Fl. Franç.* v. 2. p. 128.—*Ejusd. Syn.* p. 26.—*Sibth. Fl. Oxon.* p. 374.—*Relh. Fl. Cant.* p. 519.—*With. Bot. Arr.* ed. 6. v. 4. p. 196.—*—Purt. Midl. Fl.* v. 2. p. 620.—*Nees, Syst.* t. 31. f. 234.—*Schwein. Fung. Carol.* No. 825.—*Hook. Fl. Scot.* Part 2. p. 25.—*Host. Syn.* p. 644.—*Schum. Fl. Sæll.* 2. p. 567.—*Tratt. Schwaem.* p. 83. t. 8.—*Ejusd. Essb. Schwaem.* p. 95. t. P.

AGARICUS cantharellus, *Linn. Sp. Pl.* 1639.—*Fl. Suec.* 1207.—*Bull. Champ.* t. 62. et 505. f. 1.—*Fl. Dan.* t. 264.—*Sow. Fung.* t. 46.

AGARICUS Chantarellus, *Schæff. Fung.* t. 82.—*Bolt. Fung.* t. 62.—*Huds. Fl. Angl.* p. 609.—*Lightf. Fl. Scot.* p. 1008.

AGARICUS, No. XII. *Gled. Meth. Fung.* p. 103.

FUNGUS luteus seu pallidus, Chanterelle dictus, &c. *J. Bauh. Hist.* v. 3. p. 832.—*Ray, Syn.* p. 2.

ALECTOROPHOIDES sulcis crispis, *Batt. Fung.* p. 39. t. 14. f. A,-C.

AMANITA lutea, oris contortis, *Dill. Cat. Giss.* 179.

MERULIUS flavus, oris contortis et laceris, *Hall. Enum. Helv.* p. 38.

FUNGUS esculentus, acris, colore vitellino, &c. *Mich. Nov. Pl. Gen.* p. 144.

HAB. Woods and hedges, but especially in Fir forests and plantations. Summer and autumn; frequent.

Entire *plant* of a full buffish-yellow, or yolk of egg colour, of a rather firm yet brittle substance. *Pileus* 1–4 inches in breadth, glabrous, irregular, subrepand, frequently variously lobed, the margin rounded, the centre mostly depressed, sometimes much hollowed. *Flesh* yellowish-white, or pale yellowish. *Lamellæ* in the form of tumid veins or folds, branching dichotomously, and sometimes anastomosing. *Stipes* firm, solid, 1–2

inches long, variable in diameter, attenuated downwards. *Sporidia* oval. *Odour* none when quite fresh, but soon after having been gathered, that of ripe apricots.

It is reasonable to expect that a fungus everywhere known from time immemorial as proper to contribute towards the support of existence, shall have a great variety of appellations; and were the excellence of a species to be judged of by this test, the *Chantarelle* would bid fair to stand near the top of the list. In Germany, it is known by the following names:—Pffiffer, Pfifferling, Pfefferling, gelber Champignon, Chantarelle, Rehgeist, Eyergelber Blätterschwamm, Eynerschwamm, gelber Pfefferling, Röhling, Rübling, Rödling, Rehgäss, Rehgeiss, Reiss, Milchschwamm, Ziegenbart, Seelichen, Seelöhrchen, Salluschel, Sänsel, Himling, Hünlich, Kochmändel. In Holland we have another set of names:—Zeemleere Kampernoelje, Chantarelle, geele Champignon, Staazenoor, Zaffrankampernoelje, het Mergder Aarde, hemmelsch Manna. In Denmark, it is called Den guule Champignon, eller Chantarelle. In Sweden, Chandarelle. In France, Chanterelle, Girille, Girolle, Escau, Virolle, Girandet, Gingoule, Escraville, Cassine, Chevrille, Chevrette, Mousseline, Jeannelet, Brigoule, &c. The Italians name it Gallinattio: the Neapolitans Galluccio; the Spaniards Agarico cantarillo. In Great Britain, it is generally called the Yellow Agaric, or the Chantarelle. TRATTINICK records the term *Pickseystool* as applied to it in Devonshire, I know not on what authority; but it has evidently a reference to the Pixies, or certain provincial fairies. I do not, however, believe that the Chantarelle ever forms those circles termed fairy rings, which Dr WOLLASTON has proved to originate from some other fungi.

The old and prevalent name of *Chantarelle* was bestowed upon this species on account of a fancied resemblance it bore to the open beak, or the head of a cock in the act of crowing; and to the same cause must be traced the still older name *Gallinacei*. The name *Escraville* is merely a corruption of *Esca villæ* (food of the village). BULLIARD and PERSOON speak most highly of this fungus, as being undoubtedly wholesome, and more plentiful than any other. Eaten in a raw state, it brings on injurious consequences. In some countries, it forms almost the only food of the inhabitants; but in Great Britain it is not so abundant as the common Mushroom.

Figs. 1, 1, 1. *Cantharellus cibarius, different forms.* Fig. 2. *A section of the pileus and stipes;* natural size. Fig. 3. *A portion of the hymenium, with lamellæ.* Fig. 4. *Asci and sporidia;* magnified.

RACODIUM CELLARE.

Mouse-skin Byssus.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ, Grev.*

GENERIC CHARACTER.

Thallus e fibris opacis, obscure septatis, laxe contextus. Pseudoperidia e floccis polymorphis articulatis farctis formatisque. Sporidia nuda, distincta, floccis pseudoperidiorum inspersa.

Thallus a lax texture of opake, obscurely jointed filaments. Pseudoperidia filled with and composed of polymorphous articulated flocci. Sporidia naked, distinct, scattered among the flocci of the pseudoperidia.

SPECIFIC CHARACTER.

RACODIUM cellare; *late effusum, mollissimum, primo pallidum, demum olivaceo-nigrum.*

R. widely spreading, exceedingly soft, pale at first, at length olivaceous-black.

RACODIUM cellare, *Pers. Disp. Meth. Fung.* p. 43.—*Syn. Fung.* p. 701.—*Mycol. Eur.* v. 1. p. 67.—*Alb. et Schwein.* p. 372.—*Nees, Syst.* p. 20. t. 5. f. 70.—*Schwein. Fung. Carol.* No. 1356.—*Mart. Fl. Crypt. Erl.* p. 356.—*Hook. Fl. Scot.* Pt. 2. p. 34.—*Grev. Fl. Edin.* p. 470.—*Moug. et Nestl. Stirp. Exsicc.* No. 790.

FIBRILLARIA vinaria, *Sow. Fung.* t. 432.

BYSSUS Cryptarum, *De Cand. Fl. Franç.* v. 2. p. 67.—*Ejusd. Synop.* p. 13.

BYSSUS septica, *Huds. Fl. Angl.* p. 607. var. β.—*Roth. Fl. Germ.* 4. p. 561.—*With. Bot. Arr.* ed. 6. v. 4. p. 192. var. 2.—*Lightf. Fl. Scot.* p. 999.—*Purt. Midl. Fl.* v. 2. p. 607. var. 2.

BYSSUS mollissima, *Ehrh. Pl. Crypt. Exsicc.* No. 217. *fide Martius.*

BYSSUS tenerrima murina doliaris, *Dill. Hist. Musc.* p. 6. t. 1. f. 12.

BYSSUS major speluncis et cellis vinariis innascens, filtrum vel pannum laneum simulans, primum alba, dein nigra, filamentis tenuissimis non ramosis, *Mich. Nov. Pl. Gen.* p. 211. t. 89. f. 9. quoad Desc. partem.

FUNGUS spongiosus, niger reticulatus, doliolis vinosis adnascens, *Ray, Syn.* p. 57.—*Hist. Pl.* v. 3. p. 23.

FUNGUS spongiosus niger, pannum laneum textura simulans, doliolis vinosis adnascens, *Pluk. Alm.* p. 164.

HAB. In vaults and cellars, on casks and bottles, and even on the walls; throughout the year, common.

Spreading widely, and covering the casks or other bodies on which it grows, with a very soft woolly coat of a dull yellowish or pale reddish

colour, which passes gradually into that of a deep greenish-black. While young, the exceedingly fine filaments of which it is composed are very laxly interwoven; when mature, the whole becomes more compact, but still of a loose texture, and interspersed here and there with collections of little granules about the size of Poppy-seed. These granules or *pseudo-peridia* are little solid bodies composed of a mass of apparently broken filaments, variously jointed, some of them moniliform and fragile, and intermixed with pellucid globose sporidia. The filaments of the thallus or general mass, are branched, opake, very fine, and certainly jointed, though it requires attentive observation to perceive the articulations.

In consequence of this plant being a pretty constant inhabitant of old wine-cellars, it is natural to conclude it must have been noticed in very early times; and we do indeed find it alluded to as soon as plants of this nature began to attract the attention of botanists. Before the *Fungi* were reduced to a systematic form by the celebrated PERSOON, our plant was thrown into the comprehensive genus *Byssus*, which formed a kind of reservoir for all filamentous fungi of dubious affinity. Even DE CANDOLLE considered them as so little understood, that he thought it best not to part with so convenient a genus, at least for the present. It must be confessed, that PERSOON with whom the genus *Racodium* originated, brought together plants having no real generic affinity; and in his late work, the Mycologia Europæa, he has erred still more in this respect. FRIES, on the other hand, is industriously studying these tribes, and endeavouring to fix their generic characters upon better principles. In regard to *Racodium*, he follows the opinion of Professor LINK, excluding almost all PERSOON's species, (" paucissimæ PERSOONII species veræ").

Fig. 1. *Racodium cellare*, natural size. Fig. 2. *Filaments as they generally appear under the microscope.* Fig. 3. *Filaments very carefully examined.* Fig. 4. *One of the pseudo-peridia.* Fig. 5. *The same divided.* Fig. 6. *The appearance the pseudo-peridia present when broken down.* Fig. 7. *Sporidia:* magnified.

OZONIUM AURICOMUM.

Tawny Ozonium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ, Grev.*

GENERIC CHARACTER.

Fibræ elongatæ, articulatæ, coloratæ, plus minusve fasciculato-confluentæ. Asci ..... ?

Filaments elongated, jointed, coloured, more or less confluent and fasciculated. Asci.....?

SPECIFIC CHARACTER.

OZONIUM auricomum; *aurantiaco-fulvum, densum, polymorphum, fasciculis fibrarum rigidis, strictis.*

O. reddish-orange, dense, polymorphous, the bundle of filaments rigid, straight.

OZONIUM auricomum, *Link, in Berl. Mag.* v. 3. p. 21.—*Grev. Fl. Edin.* p. 470.

OZONIUM fulvum, *Pers. Myc. Eur.* v. 1. p. 87.

OZONIUM radians, *Pers.* l. c. p. 88.?

DEMATIUM strigosum, *Pers. Disp. Meth. Fung.* p. 75.—*Syn. Fung.* p. 695.—*Alb. et Schwein.* p. 366.—*Hook. Fl. Scot.* Pt. 2. p. 34.—*Schwein. Fung. Carol.* No. 1328.

BYSSUS barbata, *Huds. Fl. Angl.* p. 606.—*Sm. Engl. Bot.* t. 701.—*Hull. Fl.* p. 308.—*With. Bot. Arr.* ed. 6. v. 4. p. 191.—*Purt. Midl. Fl.* v. 2. p. 607.

BYSSUS fulva, *Huds.* l. c. p. 606.—*With. Bot. Arr.* v. 4. p. 191.—*Humb. Fl. Friberg,* p. 62.

BYSSUS aurantiaca, *Lam. Dict.* p. 524.—*De Cand. Fl. Franç.* ed. 3. v. 2. p. 68.—*Ejusd. Syn.* p. 13.

BYSSUS arborea, barbata, fulvi coloris, *Dill. Hist. Musc.* p. 9. t. 1. f. 19.—*Ray, Syn.* p. 57.

BYSSUS arborea crocea fibrosa, *Ray, Syn.* p. 57.—*Dill.* l. c. p. 9. t. 1. f. 17.

HAB. On rotten wood in moist places (frequently between the bark and the wood), and in caverns. Abundantly throughout the year.

Polymorphous; when young either forming an irregular network of fine woolly fibres, or rigid and springing in a diverging manner from distinct points. The plant ultimately forms masses, varying in figure according to situation, composed of dense, reddish, orange, or yellowish jointed filaments, so arranged as to constitute straight, rigid bundles of diffe-

rent thicknesses, and usually darker at the apex. Sometimes the summits of the bundles are entire, smooth and pointed; at others they seem to separate into the ultimate filaments, and become delicate and feathery. In regard to size, the whole plant depends greatly upon its place of growth. The fibres may be only a few lines in length, or near three inches, as in the specimen represented in English Botany. In some cases, as when confined closely between the bark and wood of decaying prostrate trees, the plant does not appear to be ever completely developed, but to retain the form of a fine expanded web.

As I have not succeeded in discovering any thing more respecting the nature of this plant, than what is already known, I have adopted the genus proposed for it by Professor LINK, which FRIES has also done. Its mode of reproduction seems at present to be unknown; at least perfect *asci* and *sporidia* have not been observed.

The *Byssus fulva* and *Byssus barbata* of HUDSON are only different states of the same plant; and *Ozonium radians* of PERSOON scarcely seems to be distinct from it.

Few plants accommodate themselves better to circumstances. WITHERING mentions that Lady ELIZABETH NOEL gathered a fine specimen from an old chair exposed to the drippings of a water-cistern. The upper figure in the annexed plate was taken from a beautiful one presented to me by Mr PROBART, found by him on the damp plaster ceiling of a room.

This plant also forms one of the number of those which vegetate freely in mines, excluded from light, and at a great depth. I have a specimen communicated to me by Dr HOOKER, which had been sent to him by Mr SMITH from the coal-mines of Swindrige Muir, along with a *Rhizomorpha* and a *Polyporus*.

Figs. 1. & 2. *O. auricomum, in different states.* Fig. 3. *Young plants;* natural size. Fig. 4. *Fasciculi of fibres.* Fig. 5. *Fibres;* magnified.

1

a

b

2

a

b

CONFERVA ERICETORUM.

Purple Heath Conferva.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila articulata libera distincta, uniformia, entosperma.—AG.

Filaments articulated, free, distinct, uniform, seeds internal.

SPECIFIC CHARACTER.

CONFERVA ericetorum; *filis simplicibus, intertextis, fusco-purpureis, articulis diametro subæqualibus.*

Conf. filaments simple, interwoven, brownish-purple, the articulations about as long as they are broad.

CONFERVA ericetorum, *Roth. Fl. Germ.* v. 3. p. 507.—*Cat. Bot.* v. 2. p. 206.—*Dillw. Conf.* t. 1.—*Sm. Engl. Bot.* t. 1553.—*With. Bot. Arr.* v. 4. p. 176.—*Fl. Dan.* t. 1548. f. 2.—*Schum. Fl. Sæll.* v. 2. p. 107.—*Desv. Ang.* p. 15. *Moug. et Nestl. Stirp. Crypt.* No. 694.—*Lyngb. Hydroph.* p. 140. t. 47.—*Hook. Fl. Scot.* Pt. 2. p. 81.—*Grev. Fl. Edin.* p. 318.—*Ag. Disp.* p. 28.—*Syn.* p. 76.—*Syst. Alg.* p. 87.

HAB. On the ground in moist heathy places, occasionally in the water. Summer. Frequent.

Filaments very slender, simple, creeping upon the surface of moist heathy ground, and densely interwoven into a fine web or stratum of a purple colour, varying in extent, according to circumstances, from a few inches to several feet. *Articulations* mostly nearly equal in their length and breadth; occasionally, however, they are somewhat longer than they are broad. They are furnished with a pellucid margin, but the centre is a uniform purple.

Than the present species, few are more striking or more common; and yet it remained unnoticed till the publication of Dr ROTH's Flora Germanica and Catalecta Botanica. Mr DILLWYN mentions, that he has observed it on all the moist heaths he has examined. In Scotland, I have often seen it covering a space of several square feet, like a delicate crimson carpet.

A variety of this species occurs, which seems to be merely produced by inundation. It is then lax and floating, and the articulations a little longer.

When creeping on the ground, I have noticed small radicular processes to be given off sparingly by the filaments.

Fig. 1. a, *C. ericetorum*, natural size. b, *Filaments*, magnified.

CONFERVA ALPINA.

Long-jointed Purple Conferva.

SPECIFIC CHARACTER.

CONFERVA alpina; *filis simplicibus, tenuissimis purpureis, articulis diametro quadruplo longioribus.*

Conf. filaments simple, very slender, purple, the articulations four times longer than they are broad.

CONFERVA alpina, *Bory.—Lyngb. Hydroph.* p. 139. t. 47.—*Ag. Syst. Alg.* p. 87.—*Savi, in Ust. Ann.* 21. p. 3. *fid. Ag.*

CONFERVA violacea, *Huds. Fl. Angl.* p. 592.

CONFERVA confragosa, *Lightf. Fl. Scot.* p. 976.—*With. Bot. Arr.* v. 4. p. 156.

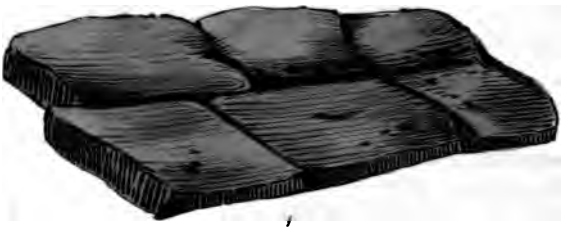
CONFERVA mucosa confragosa, rivulis innascens, *Dill. Hist. Musc.* p. 15. t. 2. f. 4.

HAB. In subalpine rivulets. Abundant in the Highlands and Western Islands of Scotland.—The station given by DILLENIUS is Llanberris in Wales.

Filaments attached to any substance in the water, exceedingly fine, elongated, either free or entangled, simple, rich dark purple, slippery to the touch. *Articulations* at least four times, often six times longer, than they are broad. Sometimes the whole filament is coloured, but generally the margin is pellucid, as well as the joints, and the coloured matter is either uniform, or collected in the centre, or at the extremities of the articulations.

The preceding well-known *Alga*, I have only introduced to contrast with this, one of the finest native species of *Conferva*, and strikingly distinguished for the great length of the articulations. It occurs in great abundance. Captain CARMICHAEL finds it at Appin, and in the Isle of Skye; the streams of even the low lands are in some places filled with it. LIGHTFOOT first discovered it in Scotland on Goatfell, in the Isle of Arran, and named it *C. confragosa*: it is omitted, however, by Dr HOOKER in his Flora Scotica.

Fig. 2. a, *C. alpina*, natural size. b, *Filaments*, magnified.



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CHLOROCOCCUM VULGARE.

Common Chlorococcum.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Link.*

GENERIC CHARACTER.

Granula omnino libera, minima, aggregata, absque gelatina.

Granules quite free, minute, aggregate, unaccompanied by a gelatine.

SPECIFIC CHARACTER.

CHLOROCOCCUM vulgare; *viridissimum, late effusum, granulis confertissimis, rotundatis, quaternatis.*

CHL. very green, widely spreading, the granules densely crowded, rounded, adhering together by fours.

LEPRARIA botryoides, *Achar. Meth. Lich.* p. 6.—*Syn. Lich.* p. 331. *in part.*—*Smith, Engl. Bot.* t. 2148.—*Purt. Midl. Fl.* v. 2. p. 604.—*Hook. Fl. Scot.* Pt. 2. p. 73.—*Grev. Fl. Edin.* p. 352.

LEPRARIA olivacea, *a, Achar. Lichenogr.* p. 666.

LEPRA botryoides, *De Cand. Fl. Franç.* v. 2. p. 522. *in part.*—*Ejusd. Syn.* p. 68.

LICHEN botryoides, *Achar. Prod.* p. 10.—*Hoffm. Enum. Lich.* p. 6. t. 1. f. 2. *fide Smith.*—*With. Bot. Arr.* v. 4. p. 3.

BYSSUS botryoides, *Fl. Dan.* t. 899. f. 3.—*Huds. Fl. Angl.* p. 608. *in part.*

HAB. On the trunks of trees, damp walls, &c.; abundant every where.

Plant of a lively full green colour, spreading very extensively over the trunks of trees, and staining the fingers on the slightest touch. *Granules* very minute, exceedingly numerous, densely aggregated, and forming an uneven surface. They are perfectly free, semitransparent, and adhere together in an opposite manner by fours; no gelatinous substratum or connecting medium is perceptible.

In my observations upon *Palmella botryoides*, represented at Plate 243. of this work, I mentioned that two plants appeared to be confounded together, under the old name of *Byssus botryoides*. I have since become confirmed in this supposition; and having already figured the *Palmella botryoides* as one of them, I proceed to offer the other under the name of

Chlorococcum vulgare. *Chlorococcum* is a genus proposed by FRIES in his Systema Mycologicum, and subsequently in his Systema Orbis Vegetabilis. Among other plants, he intended it should include the *Protococcus nivalis* of AGARDH (the Red Snow); but as this extraordinary *Alga* has really a subjacent gelatine, I have proposed at Plate 231. that the genus *Protococcus* be retained, and in that case the one invented by FRIES will be appropriately confined to those species having free granules, and no gelatine.

Authors of Floras who have described a *Byssus* or a *Lepraria botryoides*, generally seem to have examined the plant before them; but it is probable that some had *Palmella botryoides*, others *Chlorococcum vulgare*, and hence the uncertainty in descriptions, synonymes, and stations. I have no doubt that the representation in "English Botany" is our present plant; but the membranous base I have in vain patiently searched for, and conclude that the artist must have been under the influence of some deception.

It cannot escape the attentive student of these tribes, that the arrangement of the granules indicates some affinity with certain *Ulvaceæ*; the absence of a connecting membrane being the only difference.

In regard to the peculiar station of *Chlorococcum vulgare*, I am inclined to think it is mostly confined to the trunks of trees, old paling, and similar situations. On the ground it appears to be very rare indeed; while, on the contrary, I do not believe *Palmella botryoides* occurs elsewhere.

Fig. 1. *Ch. vulgare, on a piece of bark*, natural size. Fig. 2. *Mass of granules*. Fig. 3. *Granules removed*. Fig. 4. *Ditto*, magnified.

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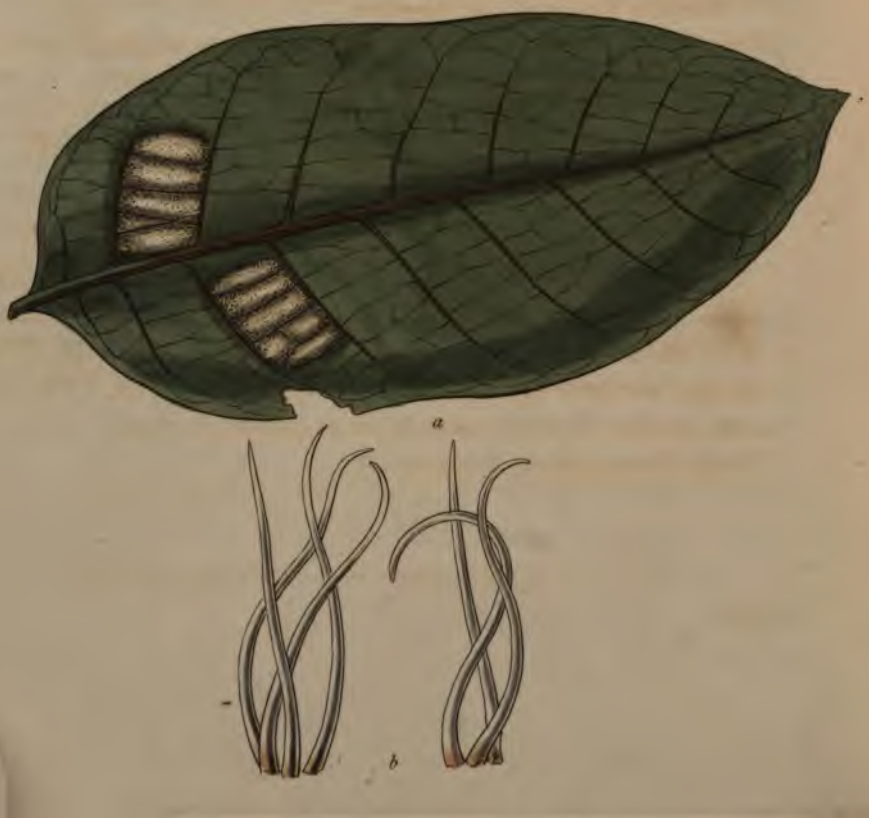
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ERINEUM Sorbi.

Incurved Mountain Ash Erineum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT ORD. *GASTROMYCI?*

GENERIC CHARACTER.

Peridia flocciformia, subdiaphana, varia, subsimplicia, aggregato-cæspitosa, foliis vivis parasitica. Sporulæ minutissimæ, sæpissime nullæ?

Peridia flocciform, subdiaphanous, various, subsimple, aggregato-cespitose, parasitic on living leaves. Sporules exceedingly minute, very often wanting?

SPECIFIC CHARACTER.

ERINEUM Sorbi; *amphigenum, distinctum vel subeffusum, superficiale; laxum, primo rubellum demum fulvo-ferrugineum; peridiis cylindricis apicibus obtusis subincurvis.*

E. on both sides of the leaf, distinct, or somewhat effused, superficial, lax, at first reddish, at length brown-ferruginous; peridia cylindrical, obtuse, and somewhat incurved at the summits.

ERINEUM Sorbi, *Funck*, MSS. *fide Kunze.—Kunze, Mycol. Hefte*, 2. p. 159.

ERINEUM Sorbeum, *Pers. Myc. Eur.* 1. p. 4.

PHYLLERIUM Sorbeum, *Deutschl. Schwaem.* No. 124.

HAB. On the leaves of the Mountain Ash *(Sorbus Aucuparia)*. Summer. Woods at Kinnordy, and elsewhere.

Plant forming distinct spots at first, afterwards often becoming confluent, especially towards the margins and extremity of the leaves; of a pale reddish-pink colour when young, but soon changing to a ferruginous-brown. *Peridia* laxly interwoven, cylindrical, rather slender, obtuse and somewhat incurved at their summits.

A second species of *Erineum* is said to grow in Sweden upon the *Sorbus Aucuparia*, and is described by Professor KUNZE under the name of *E. Aucupariæ*. It is the *Phyllerium sorbeum* of FRIES, Obs. Myc. v. 1. p. 218. The present species does not seem to be so common as most others hitherto discovered in this country.

Fig. 1. a, *E. Sorbi*, natural size. b, *Peridia*, magnified.

ERINEUM JUGLANDIS.

Walnut Erineum.

SPECIFIC CHARACTER.

ERINEUM Juglandis; *hypophyllum, subquadratum, profunde immersum, album; peridiis tenuibus suberectis, cylindricis, apice attenuatis.*

E. on the lower surface of the leaf, of a somewhat square form, deeply immersed, whitish; peridia slender, suberect, cylindrical, attenuated at the apex.

ERINEUM Juglandis, *Gærtn.—De Cand. Fl. Franç.* v. 6. p. 15.—*Enc. Meth.* v. 8. p. 217.—*Schleich. Cent. Exsicc.* 4. No. 92.—*Kunze, Mycol. Hefte,* 2. p. 170.—*Grev. Fl. Edin.* p. 450.

ERINEUM juglandinum, *Pers. Myc. Eur.* 1. p. 2.

ERINEUM subulatum, *Grev. Edin. Phil. Journ.* v. 6. p. 75. t. 2. f. 4.

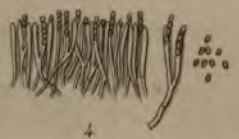
PHYLLERIUM juglandinum, *Fries, Obs. Mycol.* 1. p. 218.—*Deutschl. Schwaem.* Fasc. 8. No. 197.

HAB. On the leaves of the Walnut *(Juglans regia)*, in Summer, not unfrequent.

Plant of a pale colour, and remarkable for its quadrangular form, occasioned by being confined between the parallel veins of the leaf, soft and velvety to the touch, plane, deeply immersed in hollows of the leaf. *Peridia* slender, suberect, cylindrical, rather long, and attenuated towards the apex.

DE CANDOLLE has remarked of this species, that he has considered it a parasitic plant, in deference to other naturalists, being at the same time unable to bring forward any positive proof to the contrary. He adds, that he shall not be astonished if future observations demonstrate the peridia to be nothing more than pubescence subjected to a diseased developement. This is by no means improbable.

Fig. 2. a, *E. Juglandis upon a leaflet of Juglans regia*, natural size. b, *Peridia*, magnified.



THELEPHORA LACINIATA.

Brown jagged Thelephora.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link.*

GENERIC CHARACTER.

Hymenium cum pileo homogeneum et concretum, undique fructificatione obsitum, inæquabile, subpapillosum. "Sporidia quaternata fusco-purpurea."

Hymenium of the same substance, and not distinct from the pileus, every where covered with the fructification, uneven, somewhat papillose. Sporidia in fours, brownish-purple.

SPECIFIC CHARACTER.

THELEPHORA laciniata; *ferruginea-fusca, pileis dimidiatis, imbricatis, fibroso-squamosis, margine laciniatis.*

TH. dark ferruginous-brown, the pileus dimidiate, imbricated, somewhat scaly with fibres, laciniated at the margin.

THELEPHORA laciniata, *Pers. Syn. Fung.* p. 567.—*Alb. et Schwein.* p. 273.—*Fries, Syst. Mycol.* v. 1. p. 431.

THELEPHORA caryophyllea, v. β, *Pers. Myc. Europ.* 1. p. 112.

THELEPHORA mesenteriformis, *Fl. Dan.* t. 1198.

CORTICIUM laciniatum, *Pers. Obs. Mycol.* 1. p. 89.

AURICULARIA Caryophyllea, *Sow. Fung.* t. 213.—*Purt. Midl. Fl.* v. 3. p. 261. in part.

HELVELLA caryophyllea, *Bolt. Fung.* t. 173. *very bad.*

HELVELLA pineti, *Linn. Sp. Pl.* 2. 1649.

MERULIUS caryophylleus, *With. Bot. Arr.* v. 4. p. 200. *quoad syn. Bolt.*

HAB. On the ground, and on the exposed roots of trees chiefly in fir woods and subalpine situations, but tolerably frequent every where.

Plant of a ferruginous dark brown hue. *Pileus* 1–2 inches in breadth, somewhat irregular, dimidiate, often imbricated, more or less lobed, the surface roughish with adnate somewhat scaly dark fibres; at the margin laciniate, the substance somewhat thin and pliable. *Hymenium* uneven, rugose, thickly set with small papillæ. *Sporidia* brown, about four in number, contained in distinct *asci*. In the young state, the pileus is paler, especially at the margin, which indeed often continues paler to the last.

Having given at Plate 256. an example of what FRIES, according to his most recent investigations, considers an *Auricularia*, we now offer a specimen of the genus *Thelephora*, as restricted by the same author.

Two other species *Th. caryophyllea* and *Th. terrestris*, are nearly allied to the present one, and have mostly been confounded with it in this country, PERSOON has united our plant with the former of these; but there can be no question it ranks nearest the latter; and I follow FRIES in keeping them all distinct.

Fig. 1. *Th. laciniata.* Fig. 2. *Pileus with the hymenium exhibited,* natural size. Fig. 3. *Portion of the hymenium.* Fig. 4. *Asci and sporidia,* magnified.

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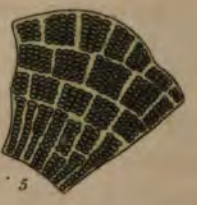

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ULVA FURFURACEA.

Minute Ulva.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Frons plana, membrana æquali. Sporidia minutissima subquaternata.—AGARDH.

Frond plane, the membrane equal. Sporidia (or minute granules) very minute, subquaternate.

SPECIFIC CHARACTER.

ULVA furfuracea; *frondibus minutissimis obovato-rotundatis, erectiusculis, cæspitoso-effusis.*

U. fronds very minute, roundish obovate, suberect, tufted and effused.

ULVA furfuracea, *Fl. Dan.* t. 1489.—*Lyngb. Hydroph.* p. 32.—*Ag. Syn.* p. 43. *Syst. Alg.* p. 190.

HAB. On the surface of wood in shady places, and also on stone. Appin, Captain CARMICHAEL. It has been found in England on the walls of King's College, Cambridge, by my acute friend M. BERKELEY, Esq.

Plant producing a green furfuraceous crust. *Fronds* scarcely a line long or broad, very numerous, tufted, somewhat erect, of an obovate or roundish form, attached by a very minute base; margin entire, undivided or somewhat lobed, more or less inflexed either at the sides or apex, or both. *Substance* delicate, composed of a very thin fine uniform membrane, bearing a prodigious number of roundish granules, often arranged in symmetrical square masses, of about 16 granules each: the membrane between the squares resembles pellucid lines passing across the whole frond, and intersecting each other at right angles. Sometimes the squares of granules are more unequal; sometimes solitary ones are formed of 4 granules only; at others, again, a great part of the frond is nearly occupied by one dense mass.

The great similarity of structure between this plant and *Bangia calophylla*, CARM. (t. 220.), and also *Scytosyphon velutinus*, LYNGB. was remarked by Mr BERKELEY, who had the kindness to communicate to me a share of the specimens he alone has hitherto had the good fortune to discover in Eng-

land. The similarity is indeed so striking, that I do not believe a doubt could exist in the mind of any one who saw them together, of their being individuals of the same genus.

I have adopted AGARDH's character of the genus *Ulva*, but it seems to me as if it wanted revision. In short, we require to know a little more regarding the reproduction of some of these plants; and till this point can be satisfactorily decided, the fructification should be rather avoided in the character. Are the granules, which, in fact, give the dark green colour to the frond, to be considered seeds? This is very doubtful, indeed; and yet we have an easy transition to *Chlorococcum vulgare*, where granules apparently similar form the entire plant, and must necessarily contain the fructification. The fructification of *Bangia calophylla* and *Scytosyphon velutinus*, is equally unknown.

Fig. 1. *Ulva furfuracea*, natural size. Fig. 2. *A tuft of fronds.* Fig. 3. *Separate fronds.* Figs. 4, 5, 6. *Portions of fronds exhibiting different arrangements of the granules*, magnified.

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TRICHIA RETICULATA.

Reticulated Trichia.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT ORD. *GASTROMYCI, Link.*

GENERIC CHARACTER.

Peridium simplex, membranaceum, persistens, apice irregulariter rumpens. Sporidia inspersa floccis versus basin adnatis, intortis, elastice sese expandentibus.

Peridium simple, membranaceous, persistent, bursting irregularly at the apex. Sporidia scattered among the filaments, which are fixed to the base, and expand elastically.

SPECIFIC CHARACTER.

TRICHIA reticulata; *effusa, angusta, peridio serpente reticulum irregulare formante, castaneo.*

T. effused, narrow, the peridium creeping, forming an irregular network, chesnut coloured.

TRICHIA reticulata, *Pers. Syn. Fung.* p. 182.—*Icon. et Descript. Fung.* Fasc. 2. p. 46. t. 12. f. 1.—*Nees, Syst.* p. 31. t. 10. f. 111.—*Grev. Fl. Edin.* p. 454. *Schwein. Fung. Carol.* No. 393.

LYCOGOLA contortum, *Ditm. in Deutschl. Fl. (Fungi)*, t. 5.

LYCOPERDON lumbricale, *Batsch. Elench. Fung.* Cont. 1. p. 259. f. 174.—*Willd. Fl. Berol.* p. 414.

HAB. On rotten trunks of trees, and similar situations, very rare. At Caroline Park, near Edinburgh.

Plant soft and pulpy when young, effused, and running into narrow lines, which anastomose, and thus form an irregular network. *Peridium* narrow, of a chesnut colour, somewhat depressed, sometimes instead of forming a network creeping in contorted wavy lines, very thin, bursting irregularly. *Sporidia* bright yellow, plentiful, globose.

I am happy in being able to represent so rare a species as a specimen of the genus *Trichia*, constituted by the illustrious HALLER, and defined as we have given it by the indefatigable FRIES in his Systema Orbis Vegetabilis. PERSOON charac-

terizes the plant as "rarissime," and probably justly: I have never seen more than a solitary specimen, and few authors notice it.

The genus *Trichia* is most nearly allied to *Arscyria*, which we have illustrated at Plate 130.; but in the latter, the peridium is horizontally divided, and the upper portion is deciduous.

Fig. 1. *T. reticulata*, natural size. Fig. 2. *Plants of different forms.* Fig. 3. *Sporidia and filaments*; magnified.

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SPUMARIA Mucilago.

White Spumaria.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *GASTROMYCI, Link.*

GENERIC CHARACTER.

Peridium effiguratum, simplex, celluloso-floccosum, in medio fatiscens; intus sporidia coacervata plicis membranaceis adscendentibus interstincta.—Fries.

Peridium of no regular figure, simple, cellulose and floccose, bursting in the centre; within, the sporidia are collected into distinct masses within the folds of an ascending plicate membrane.

SPECIFIC CHARACTER.

Spumaria Mucilago; *effusa, albida, membrana interna plicata ramoso-cornuta.*

S. effused, whitish, the internal plicate membrane branched in a horn-like manner.

Spumaria Mucilago, *Pers. Obs. Myc.* 1. p. 94.—*Disp. Meth. Fung.* p. 8. t. 1. f. 1.—*Syn. Fung.* p. 163.—*Alb. et Schwein.* p. 87.—*Nees, Syst.* p. 27. t. 8. f. 94.—*Schwein. Fung. Carol.* No. 360.

Spumaria alba, *De Cand. Fl. Franç.* v. 2. p. 261.—*Ejusd. Synop.* p. 54.—*Grev. Fl. Edin.* p. 452.

Reticularia alba, *Bull. Champ.* p. 92. t. 326.—*Sow. Fung.* t. 280.—*Purt. Midl. Fl.* v. 2. p. 703. et v. 3. p. 481. t. 21.—*Relh. Fl. Cant.* ed. 3. p. 568.

Reticularia ovata, var. 2. *With. Bot. Arr.* ed. 6. v. 4. p. 461.

Mucilago crustacea alba, *Mich. Nov. Gen. Pl.* t. 96. f. 2.

Mucor spongiosus, *Leyss. Fl. Halensis*, No. 1274. *fide Pers.*

Fuligo ovata, laminosa alba, *Hall. St. Helv.* p. 111.

Hab. On leaves, sticks, stems of plants, grass, &c. in autumn, frequent.

Plant in its young state having the appearance of a white froth, extremely various in magnitude, which envelopes the slender stems of grasses, and similar substances. At this period, it is quite soft and pulpy; but in a few days it becomes of a firmer texture, the surface begins to scale off, to burst in the centre, and to emit a vast number of dark coloured globose *sporidia*. When the sporidia have escaped, they are found to have been contained in numerous, branched, horn-like, nearly erect, membranaceous folds, resembling irregular, imperfect, divided tubes.

Spumaria Mucilago is the most common species of a very small genus, and in the autumn may often be observed attached to the stems or the inflorescence of grasses, very frequently, too, several inches above the ground, so that its froth-like appearance seems at first sight the production of some insect.

The genus was established by PERSOON at the expence of that named *Reticularia* by BULLIARD. It comes near to *Æthalium* of LINK (the *Reticularia hortensis*, BULL.), but is remarkably well characterised by the singular branched subtubular membrane within, which seems to be an aggregate series of *peridia*. The form of this species is inconstant, yet there is a general tendency to an oval or roundish outline. This was very conspicuous in the specimens represented in the plate, and may be said to prevail in those of a moderate size.

Fig. 1. *Plants of S. Mucilago in an entire state.* **Fig. 2.** *A plant discharging its sporidia.* **Fig. 3.** *A plant after the sporidia have escaped;* natural size. **Fig. 4.** *Some of the internal membranaceous folds.* **Fig. 5.** *Sporidia;* magnified.

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ÆGERITA CANDIDA.

White Ægerita.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI? Link.*

GENERIC CHARACTER.

Sporidia globosa, laxe incumbentia receptaculo rotundato grumoso.

Sporidia globose, laxly produced on the surface of a rounded grumose receptacle.

SPECIFIC CHARACTER.

ÆGERITA candida; *candida hemisphærica glabra; sporidiis inæqualibus.*

Æ. white, hemispherical, glabrous; sporidia unequal.

ÆGERITA candida, *Pers. Disp. Meth. Fung.* p. 40.—*Syn. Fung.* p. 684.—*Alb. et Schwein.* p. 355.—*Nees, Syst.* p. 7. t. 2. f. 24.—*Mart. Fl. Erlang.* p. 326.—*Schwein. Fung. Carol.* No. 1274.

SCLEROTIUM Ægerita, *Hoffm. Fl. Germ.* 2. t. 9. f. 1.

HAB. On damp decaying wood; frequent in autumn.

Plants very minute, about the size of tobacco-seed, scattered, white, hemispherical, glabrous, composed of a grumose roundish *receptacle*, upon which the globose unequal *sporidia* are loosely disposed.

A very minute plant, first observed in Scotland by my friend Captain CARMICHAEL. PERSOON does not seem to have observed the sporidia, which are globose, and, in the specimens which I have examined, unequal in size.

Fig. 1. a, *Ægerita candida*, natural size. b, *A group of plants.* c, *A plant divided.* d, *Sporidia*; magnified.

ÆGERITA SETOSA.

Bristly Ægerita.

SPECIFIC CHARACTER.

ÆGERITA setosa; *candida, hemisphærica, setulis elongatis albidis obsita.*

Æ. white, hemispherical, set with white elongated bristles.

ÆGERITA setosa, *Carm.* MSS.

HAB. On decaying damp wood. Appin, Captain CARMICHAEL.

Plants minute, but somewhat larger than the preceding, white and hemispherical, bearing a number of white, sharp bristles, longer than the diameter of the plant, and spreading in every direction. Within, apparently mixed with the *sporidia*, are slender fusiform bodies; the sporidia are globose. *Receptacle* obscure.

This little plant certainly approaches nearer to the genus *Ægerita* than any other, if it be not indeed a true species. The receptacle is obscurely developed; but, though the bristles and fusiform bodies are remarkable, the whole habit is that of an *Ægerita*.

Fig. 2. a, *Æ. setosa*, natural size. b, *A group of plants.* c, *A plant divided.* d, *Bristles, fusiform bodies, and sporidia;* magnified.

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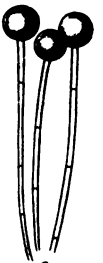

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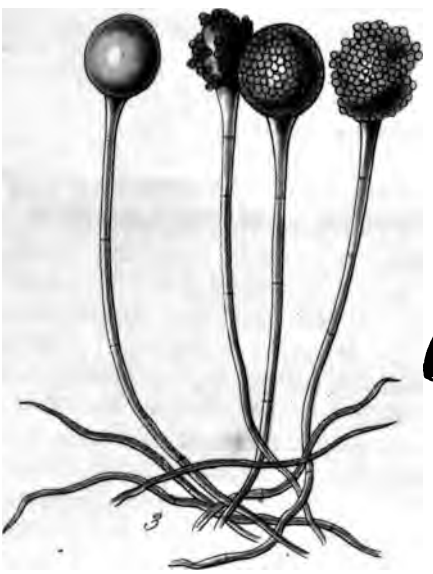

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ASCOPHORA Mucedo.

Common Ascophora.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—Nat. Ord. *GASTROMYCI? Link.*

GENERIC CHARACTER.

(Peridiola tenuissima fugacissima?) Sporidia globosa (demum?) nuda, in capite inflato, externe coacervata. Capita solitaria, floccis septatis, erectis, stipitata.

(Peridiola exceedingly thin and fugacious?) Sporidia globose, (at length?) naked, disposed on the external surface of an inflated head. Heads solitary, stipitate, on erect, articulated flocci.

SPECIFIC CHARACTER.

Ascophora Mucedo; *aggregata, mucoriformis, capitulis sphæricis, ex albido nigro-cæseis, sporidiis sporidiola globosa minima includentibus.*

A. crowded, mucor-like, the little heads spherical, at first whitish, at length dark grey; sporidia enclosing minute globose sporidiola.

Ascophora Mucedo, *Tode, Fung.* p. 13. t. 3. f. 22.—*Albert. et Schwein.* p. 356.—*Link, in Berl. Mag.* v. 3. p. 30. t. 2. f. 43.—*Nees, Syst.* p. 83. t. 6. f. 80.—*Mart. Fl. Erl.* p. 362.—*Schwein. Fung. Carol.* No. 1286.—*Grev. Fl. Edin.* p. 448.

Mucor Mucedo, *Pers. Syn. Fung.* p. 201.—*De Cand. Fl. Franç.* v. 2. p. 248.?—*Ejusd. Syn.* p. 52.?—*Purt. Midl. Fl.* v. 3. p. 501. *in part.*—*Hook. Fl. Scot.* Pt. 2. p. 13. *excl. syn. Sow.*—*Schum. Fl. Sæll.* v. 2. p. 237.

Mucor ascophorus, *Link, Sp. Pl. Willd. Continuat.* v. 6. p. 85.

Mucor roridus, *Willd. Ust. Bot. Mag.* 4. p. 1. *fide Link.*

Mucedo grisea, *Pers. Disp. Meth. Fung.* p. 14.

Hab. Various putrefying substances, especially bread, paste, &c. Extremely common.

Plant crowded and delicate, 2–4 lines in height. The *stems* are like those of a *Mucor*, pellucid, colourless, very slender, articulated, simple; the fertile ones 1–4 lines in height, while many barren ones lie prostrate and interwoven at the base. Each of the erect stems supports a solitary globular little head, which, in the young state, is a mere globule of viscid fluid, of a whitish or yellowish colour; but it insensibly becomes firmer, gradually assumes a bluish hue, and at length shews itself to be covered by an uniform mass of *sporidia*, of a dark greenish-grey colour. Within, the head is hollow and inflated, the membrane of which it is formed white and very thin. *Sporidia* rather large, numerous, globose, dark grey, entirely covering the head with a uniform layer, enclosing 2–3 minute, round *sporidiola*.

Respecting the little plant now described, a good deal of diversity of opinion has existed, and indeed it still seems to remain, in the minds of naturalists. TODE, with whom the genus originated, and who first published the species in question, characterizes the little heads as inflated, opaque, elastic, and producing the fructification externally. He describes the little head, when the plant is mature, as bursting with an elastic force, and scattering the sporidia on all sides, The rupture, according to him, occurs at the base, and is so complete as to surround the apex of the stem, and set it at liberty: it consequently penetrates the cavity, and the membranous case collapsing, eventually assumes a hemispherical figure. Botanists in general do not seem to have examined this curious plant very carefully since TODE described it; but an idea seems to have crept in, that the sporidia were produced internally. Thus, the figure of *Mucor sphærocephalus* of BULLIARD has been quoted, which represents the seeds as copiously emitted from the interior of the ruptured and half-vanished peridium. The same may be said of *Mucor Mucedo* and *Mucor roridus* of BOLTON. It is certain that the sporidia can be never seen to escape in this manner. Professor LINK, in his continuation of the Sp. Plantarum by WILLDENOW, expressly denies, on the authority of DITMAR, that the sporidia are produced externally, but that in the young state, when the heads are watery and pellucid, they are situated within them. He has therefore united our plant to the genus *Mucor*, and cited the figure of BULLIARD above mentioned. My friend M. FRIES, though he has the genus ASCOPHORA in the introduction to his Systema, seems to have adopted the opinion of LINK in his subsequent work, the Systema Orbis Vegetabilis; but I hope he may be induced to reconsider the matter, with his usual liberality. I have sown and propagated several crops of this fungus, and examined it in all its states, and have always found the entire head covered with sporidia at a certain period, and no rupture visible. After the sporidia have fallen off, I have mostly found the inflated membrane perfectly entire, and at all times, when possible to examine it, quite empty. I have seen heads of an hemispherical form, produced by a mere collapse of the membrane, without any apparent dehiscence. The equal manner in which the sporidia are spread over the whole head, precludes the idea of their having escaped from the interior by any one orifice.

Fig. 1. *A. Mucedo*, natural size. Fig. 2. *Plants in different stages of growth.* Fig. 3. *Mature plants.* Fig. 4. *Heads having lost their sporidia.* Fig. 5. *A head collapsed.* Fig. 6. *A head artificially ruptured.* Fig. 7. *Sporidia.* Fig. 8. *Sporidiola;* magnified.

FISTULINA HEPATICA.

Fleshy Fistulina.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *FUNGI, Link.*

GENERIC CHARACTER.

Hymenium tubulosum, distinctum sed pilei substantia concretum. Tubi primo verruciformes subremoti, clausi, radiato-fimbriati, demum approximati elongati aperti.

Hymenium tubular, distinct but not separable from the substance of the pileus. Tubes at first wart-like, somewhat remote, shut, radiato-fimbriate, at length approximate, elongated, open.

SPECIFIC CHARACTER.

FISTULINA hepatica;.....

FISTULINA hepatica, *With. Bot. Arr.* v. 4. p. 371.—*Sibth. Fl. Oxon.* No. 1071.—*Relh. Fl. Cant.* p. 544.—*Winch, Bot. Guide,* 2. p. 93.—*Fries, Syst. Myc.* v. 1. p. 396.—*Grev. in Wern. Trans.* v. 4. p. 373.

FISTULINA buglossoides, *Bull. Champ.* p. 314. t. 74. 464. et 497.

FISTULINA Buglossum, *Pers. Disp. Meth. Fung.* p. 29.

BOLETUS hepaticus, *Huds. Fl. Angl.* v. 2. p. 625.—*Schæff. Fung.* t. 116.–120.—*Ejusd. Comment.* p. 46.—*Schrad. Spicil.* p. 157.—*Gmel. Syst. Nat.* v. 2. p. 1438.—*Sow. Fung.* t. 58.—*Bolt. Fung.* t. 79.—*Pers. Syn. Fung.* p. 549.—*Alb. et Schwein.* p. 259.—*De Cand. Fl. Franç.* v. 2. p. 113.—*Ejusd. Syn.* p. 23.—*Trattin. Essb. Schwäm.* p. 123. t. 5.—*Ejusd. Dest. Schwäm.* p. 116. t. 12.—*Lightf. Fl. Scot.* p. 1034.—*Wild. Fl. Berol.* p. 391.—*Purt. Midl. Fl.* v. 2. p. 670.—*Nees, Syst.* p. 55. t. 26. f. 209.—*Schwein. Fung. Carol.* No. 944.—*Hook. Fl. Scot.* Part 2. p. 26.

BOLETUS Buglossum, *Retz, Fl. Scand.* 2. p. 250.—*Vahl, Fl. Dan.* t. 1136, 1137.

BOLETUS sanguineus, *Plan. Fung. Erfurt.* p. 25. *fide Trattin.*

HYPODRYS, *Pers. Champ. Comest.* p. 245.

POLYPORUS sessilis sanguineus crassus mollis obscure lobatus, *Hall. Hist.* No. 2315.

AGARICUS porosus rubens carnosus, hepatis facie, *Dill. Giss.* p. 192.—*Ray, Syn.* p. 23.

AGARICUM esculentum, hepatis facie, *Mich. Gen. Pl. Nov.* p. 117. t. 60.

AGARICUS gelatinosus, parte prone erinaceus, *Buxb. Cent.* 1. t. 56. f. 2.

HAB. On the trunks of Oak-trees, in autumn, rare. Jardine Hall, Sir WILLIAM JARDINE, Bart. Near Inverness.—In England, it appears to be produced equally sparingly.

Pileus 4–8 inches broad, exceedingly variable in form, being either quite sessile or obliquely stipitate, entire or lobed, solitary, or several growing together in a tufted manner, but rarely at all imbricated. The *substance* is very thick, soft, fleshy, viscid and juicy, especially in a young state, when a blood-like fluid is emitted if it be wounded: the fibres composing the substance are tenacious; and in tearing the pileus, they are found

to pass from the base towards the extremity. When the pileus is divided longitudinally by a knife, it is beautifully marbled with red and white, somewhat like fine beef. The *colour* of the pileus is at first a fine red, passing into a pale yellow towards the base; in age it becomes deeper, and at length of a fine chocolate colour. The surface is rendered more or less rough, by minute, prominent, rigid points, which may be denominated abortive tubes, as they are the termination of fibres which, under other circumstances, would have formed perfect ones. The *Hymenium* is whitish or yellowish, and composed of a multitude of tubes between a quarter and half an inch in length, perfectly distinct from each other, but so connected to the substance of the pileus as not to be separated from it, as in the genus *Boletus*. In the young state, the first appearance of tubes is in the form of minute coloured warts, situated at a little distance from each other, the intervening spaces being filled up with a fibrous juicy mass, which gradually disappears as the tubes become developed. Some of the warts are conical, others furnished with a spreading radiated border of short filaments, which close the orifice, and act as a veil to the infant tubes: the conical ones are probably merely unexpanded. In this commencement of the tubes, they are very short, scarcely more than a line in length, and barely possess a cavity. As they become more developed, they elongate, approximate by the simple enlargement of their diameter, and gradually acquire an open orifice by the disappearance of the fimbriated veil. When at their full growth, they are in complete contact, 2–4 lines in length, of a white colour, sometimes tinted with pink and even green, and quite open at the extremity, which is now only a little ragged. *Asci* very minute. *Sporidia* minute, globose.

To my friend Sir WILLIAM JARDINE, Bart. in whose eyes no department of natural history is deficient in attractions, the present work is indebted for a representation of one of our rarer and most curious *Fungi*. It is only the second instance within my own knowledge of its having been found north of the Tweed. *Fistulina hepatica* has at first sight a near resemblance to a piece of bullock's liver, whence the specific name; but the similarity to an animal substance is not confined to external appearance,—the interior has the same; and it is said to have somewhat of an animal flavour when dressed. It is very generally eaten and esteemed on the Continent; the French calling it Langue de bœuf, Foie de bœuf, Glue de Chene, Langue de Chene, &c.; the Tuscans Lingua de Castagno; the Piedmontese Langhe. Old authors on the *Materia Medica* call it *Hypodrys*, a name given to it by SOLENANDER, according to PERSOON; but the latter, with his characteristic paucity of reference, does not mention in what work, though he has very unnecessarily substituted it for that of *Fistulina*.

Fig. 1. *F. hepatica.* Fig. 2. *A part of a pileus divided,* natural size. Fig. 3. *Mature tubes.* Fig. 4. *A portion of the hymenium, shewing the progress of the tubes from the young state.* Fig. 5. *Sporidia;* magnified.

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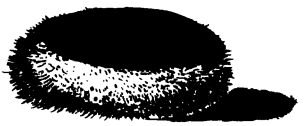

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TRICHODERMA VIRIDE.

Green and White Trichoderma.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI? Link.*

GENERIC CHARACTER.

Peridium indeterminatum, e floccis ramosis implexis contextum, demum in medio evanescens. Sporidia minutissima, sicca, conglobata.—FRIES.

Peridium indeterminate, composed of branched interwoven filaments, at length obliterated in the centre. Sporidia very minute, dry, collected into a mass.

SPECIFIC CHARACTER.

TRICHODERMA viride; *subrotundum, album, floccis densissime contextis demum fugacibus: sporidiis viridis copiosis.*

T. roundish, white, the flocci very densely interwoven, at length obliterated: sporidia green, numerous.

TRICHODERMA viride, *Pers. Disp. Meth. Fung.* p. 12.—*Syn. Fung.* p. 231.—*Alb. et Schwein.* p. 135.—*Nees, Syst.* p. 21. t. 6. f. 74.—*Mart. Fl. Erlang.* p. 361.—*Schwein. Fung. Carol.* No. 518.—*Grev. Fl. Edin.* p. 465.

PYRENIUM lignorum, *a, Tode, Fung.* 1. p. 33. t. 3. f. 29.

SPHÆRIA olivacea, *Willd. Fl. Berol.* p. 416.

HAB. On the trunks and branches of prostrate decaying trees, in autumn. Frequent.

Plant gregarious, at first very white and cottony, varying greatly in size, 1–4 lines broad, mostly of a roundish form, somewhat depressed, distinct, or confluent, of a firm consistence, but entirely floccose, and very soft on the surface. The *sporidia* are globose, very minute, of a green colour, and collected into a mass in the centre of the peridium; the summit at length gives way, the filaments appear to be quite obliterated, and the sporidia, which are of a dry nature, escape; thus by degrees the white colour of the flocci is superseded by the green colour of the sporidia.

This curious fungus, of which a representation is now for the first time given in a British work, has little real affinity with other known species. WILLDENOW considered it as so nearly related to the *Sphæriæ*, that he placed it among them. FRIES

has arranged it with more propriety in the third Order of his great Division *Gasteromycetes*, after *Dichosporium* and *Myrothecium*. Though the substance of the plant is entirely floccose, yet a kind of *peridium* appears to be formed by the dense interweaving of the filaments. If a plant be divided just before maturity, the green sporules will be seen lying in a compact mass, forming a thick stratum, varying according to the shape of the peridium, which is generally either roundish or oblong. When mature, the most curious property of this fungus is exhibited: the summit does not actually burst, or become lacerated, as in most other *Gasteromycetes*, but vanishes, or, by some means or other, the filaments composing the summit of the peridium are broken down, and obliterated; and this process gradually proceeds from the summit to the base, so that at length little is left besides the pulverulent mass of dry green sporidia, which have thus an opportunity of complete dispersion.

Fig. 1. *Plants of T. viride*, natural size. Fig. 2. *A peridium entire.* Fig. 3. *A peridium with the summit becoming obliterated.* Fig. 4. *A peridium divided vertically.* Fig. 5. *Filaments or flocci, and sporidia*,—magnified.

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ÆTHALIUM FLAVUM.

Common Æthalium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT ORD. *GASTROMYCI, Link.*

GENERIC CHARACTER.

Peridium difforme, duplex; exterius floccosum evanescens, interius membranoso-cellulare fatiscens. Sporidia conferta, cellulis membranaceis intercepta.

Peridium irregular, double: the external one floccose, evanescent, the internal one membranous, cellular, falling away. Sporidia crowded, intercepted by the membranous cells.

SPECIFIC CHARACTER.

ÆTHALIUM flavum; *effusum vel subrotundatum, flavum, cinnamomum vel pallidum; sporidiis nigrescens.*

Æ. effused or roundish, yellow, cinnamon or pale coloured: sporidia at length black.

ÆTHALIUM flavum, *Link.—Nees, Syst.* p. 26. t. 8. f. 92.—*Mart. Fl. Erlang.* p. 370.

FULIGO flava, *Pers. Disp. Meth. Fung.* p. 8.—*Syn. Fung.* p. 161.—*Alb. et Schwein.* p. 86.—*Schwein. Fung. Carol.* No. 357.—*Hook. Fl. Scot.* Pt. 2. p. 12.

FULIGO vaporaria, *Pers. Obs. Myc.* 1. p. 92.—*Syn. Fung.* p. 161.—*Alb. et Schwein.* p. 86.—*Schwein.* l. c. No. 358.—*Hook. Fl. Scot.* Pt. 2. p. 12.

FULIGO rufa, *Pers. Disp. Meth. Fung.* p. 8.?—*Syn. Fung.* p. 159.?—*Alb. et Schwein.* p. 86.?—*Schwein.* l. c. No. 355.

FULIGO pallida, *Pers. Obs. Mycol.* 2. p. 36.

FULIGO candida, *Pers. Obs. Myc.* 1. p. 92.—*Syn. Fung.* p. 162.—*Alb. et Schwein.* p. 87.—*Schwein.* l. c. No. 359.

RETICULARIA hortensis, *Bull. Champ.* p. 86. t. 424.—*De Cand. Fl. Franç.* v. 2. p. 260.—*Ejusd. Syn.* p. 54.—*Sow. Fung.* t. 399. f. 1.—*Purt. Midl. Fl.* v. 2. p. 703.—*Grev. Fl. Edin.* p. 452.

RETICULARIA lutea, *Bull.* l. c. p. 87. t. 380. f. 1.—*Sow. Fung.* t. 399. f. 2.—*De Cand. Fl. Franç.* v. 2. p. 260.—*Ejusd. Syn.* p. 54.—*Purt. Midl. Fl.* v. 3. p. 275.—*Hook. Fl. Scot.* Pt. 2. p. 12.—*Grev. Fl. Edin.* p. 452.

RETICULARIA ovata, var. 1. *With. Bot. Arr.* ed. 6. v. 4. p. 460.—*Relh. Fl. Cant.* ed. 3. p. 567.

RETICULARIA septica, *With.* l. c. p. 460. vars. 1. et 2. *(descriptio primaria ad Lycogolam argenteam pertinet.)*—*Relh. Fl. Cant.* p. 567.—*Purt.* l. c. v. 2. p. 703.

RETICULARIA carnosa, *Sow. Fung.* t. 399. f. 3. *non Bull.?*

RETICULARIA cerea, *Sow. Fung.* t. 399. f. 4.

MUCOR septicus, *Linn. Sp. Pl.* p. 1656.—*Bolt. Fung.* t. 134.—*Lightf. Fl. Scot.* v. 2. p. 1073.—*Fl. Dan.* t. 778.

Mucor ovatus, *Schæff. Fung.* t. 192.

Lycoperdon luteum gregarium, *Jacq. Misc.* v. 1. t. 8.

Mucilago filamentosa ramosa, *Bonanni*, 135. t. 3. *fide Bulliard.*

Mucilago crustacea alba, *Mich. Nov. Gen. Pl.* t. 96. f. 2.

Spongia fugax mollis, flava et amœna, in pulvere coriareo nascens, *Marchand, Mém. de l'Acad. Franç.* ann. 1727, p. 334. t. 12.

Hab. On tan, both in the open air and in tan-pits, frequent: also on masses of dead leaves, on trunks of decaying trees, and sometimes even on living herbs. Autumn.

Plant exceedingly variable, effused, soft and pulpy in the young state, having a general tendency to assume rounded forms, but often spreading in irregular masses, 1–12 inches in breadth or more, and an inch or more in thickness. It grows with amazing rapidity. From its pulpy and slimy state, it changes to one as remarkable for dryness. The *peridium* is double: the *outer one* somewhat floccose, or between floccose and furfuraceous, evanescent: the *inner one* membranaceous, exceedingly fragile, dividing the substance into innumerable small cells, which are filled with globose blackish sporidia. When mature, the whole plant crumbles under the slightest touch.

This singular plant is well known to gardeners as the great nuisance of the hot-house and tan-pit, where its rapidity of growth is only equalled by the suddenness of its appearance. It not only spreads over the surface of the tan, but envelopes in its slimy embrace, and disfigures the beauty of the most delicate herbaceous plants.

That too many species have been made from this fungus scarcely admits of a question; but I have not brought together so many synonymes without some diffidence, though, as far as my opportunity of judging extends, I see no characters to keep any of them distinct. I should even have added *Reticularia carnosa* of Bulliard, if that author had not stated particularly that it became hard and solid in age like a truffle; for in every other respect it exactly agrees with our plant. Bulliard justly observes of his *Reticularia hortensis*, that a "thousand local circumstances influence its form and dimensions:" he might probably have added, with equal reason, its consistence and colour. Among different localities, he mentions having noticed it upon rocks, at a very considerable elevation.

Fig. 1. *A young plant of Æ. flavum*, natural size. Fig. 2. *A young plant of a paler colour.* Fig. 3. *A mature plant; with one in an old state behind it*, natural size. Fig. 4. *Sporidia*; magnified.

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DIDYMOSPORIUM BETULINUM.

Birch-tree Didymosporium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *EPIPHYTÆ, Link.*

GENERIC CHARACTER.

Sporidia subrotundata, didyma, conglobata, per epidermidem emortuam erumpentiam.—Stroma spurium.—FRIES.

Sporidia somewhat roundish, didymous, forming a mass, bursting through the dead epidermis.—Receptacle spurious.

SPECIFIC CHARACTER.

DIDYMOSPORIUM betulinum; *sporidiis ovalibus, subæqualiter 1-septatis, atris, in cumulum subconicum erumpentibus; stromate depresso-conico, basi late effuso, sulphureo.*

D. sporidia oval, nearly equally uniseptate, black, bursting forth into a subconical heap: the receptacle depressed-conical, spreading widely at the base, yellowish.

DIDYMOSPORIUM elevatum, *Link, Sp. Pl. Willd. Continuat.* v. 6. Pt. 2. p. 94.

MELANCONIUM betulinum, *Kunze, Deutschl. Schwaem.* 9. No. 208.—*Moug. et Nestl. St. Exsicc.* No. 670.

STILBOSPORA spermatodes, *Link, Obs.* 2. p. 30.

STILBOSPORA betulinum, *Pers. in Litt. fide Moug. et Nestler.*

HAB. On the trunks and branches of dead Birch-trees *(Betula alba)*; at all seasons. Roslin Woods.

Plant produced beneath the epidermis of the bark, bursting through it and becoming effused, in the form of little deep black conical masses, 1–3 lines in breadth. *Sporidia* copious, very minute, oval, didymous, surrounding a spurious depressed-conical receptacle, widely spreading at its base, and of a yellowish colour; in age becoming sometimes obliterated.

The genus *Didymosporium*, now for the first time represented in a British work, was instituted by my excellent friend Professor NEES AB ESENBECK in his *System der Pilze und Schwaemme*. It appears to rest its character, when compared with *Melancomium*, only upon the didymous sporidia. The

subject of the present description was originally published by Professor KUNZE as a *Melancomium*; but if the distinction is to hold good between the two genera, as defined by NEES and FRIES, it must belong to *Didymosporium*, where, indeed, it has been already placed by LINK, on account of its didymous sporidia. The two genera are evidently so nearly related, that it is doubtful whether they will be both retained when the species are more accurately investigated.

Fig. 1. *D. betulinum, on birch-bark;* natural size. Fig. 2. *A section of two plants, one of them exuding its sporidia through the epidermis.* Fig. 3. *A horizontal section of a plant, shewing the black mass of sporidia, surrounding the spurious receptacle.* Fig. 4. *Sporidia;* magnified.

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BOTRYTIS NIGRA.

Black Botrytis.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *BYSSOIDEÆ.*

BOTRYTIS, TRIB. III. PANICULATI, *Fries.*

GENERIC CHARACTER.

Flocci septati, liberi, fertiles erecti apicibus simplicibus. Sporidia simplicia, circa ramos apicesve collecta.—FRIES.

Flocci jointed, free, the fertile ones erect, with simple summits. Sporidia simple, collected about the branches and summits.

SPECIFIC CHARACTER.

BOTRYTIS nigra; *effuso-cæspitosa, nigra, floccis fertilibus subdichotome ramosis, ramis erectis attenuatis; sporidiis globosis nigris circa ramos collectis.*

B. tufts widely effused, black; fertile flocci somewhat dichotomously branched; the branches erect, attenuated; sporidia globose, black, distributed about the branches.

BOTRYTIS nigra, *Link, in Berl. Mag.* v. 3. p. 14. t. 1. f. 19.—*Ejusd. Sp. Pl. Willd. Cont.* v. 6. Pt. 1. p. 62.—*Pers. Myc. Eur.* 1. p. 37.

VIRGARIA nigra, *Nees, Syst.* p. 54. t. 4. f. 52.—*Martius, Fl. Erlang.* p. 342.

HAB. On the dead trunks and branches of trees. Appin, Captain CARMICHAEL. About Edinburgh, not frequent.

Plant spreading in wide effused patches several inches in breadth, of an extremely deep black colour. *Fertile flocci* 2–3 lines in height, very slender, branched from near the base in a somewhat dichotomous manner; the branches long, erect, virgate, attenuated to a fine point. *Sporidia* globose, very copious, surrounding and attached to the branches.

FRIES has justly observed, that *Botrytis* of authors, and many genera related to it, differ in the character of the ramification, while in more important points they entirely agree: he therefore proposes to unite the whole, and from the subordinate characters to constitute tribes or subgenera. The genera he has thus reduced, are *Cladobotryum*, NEES, *Virgaria*, NEES, *Spicularia*, PERSOON, *Polyactis*, LINK, *Acladium*, LINK, *Haplaria*, LINK. The genus *Stachylidium* of NEES is also

reduced, with a mark of doubt; but this appears justly enough to deserve to be sustained. PERSOON, in his Mycologia Europæa, had already united *Cladobotryum*, *Virgaria*, *Stachylidium* and *Verticillium*; and my friend M. ADOLPHE BRONGNIART has expressed his opinion that *Botrytis* should include *Penicillium*, *Cladobotryum* and *Stachylidium*; and that *Virgaria* should form a distinct genus, comprehending *Haplaria* and *Acladium*.

The specimens discovered by Captain CARMICHAEL had a different appearance from that which is usually presented by this plant; the branches were here and there united longitudinally among themselves, half a dozen distinct plants being thus sometimes connected together in the most irregular manner. This circumstance induced Captain CARMICHAEL to name his plant *Botrytis inosculans*, but, as in all other respects it did not differ from the true *B. nigra*, and, besides, had rather the aspect of disease or accident, I have hesitated to retain it as a species.

Fig. 1. *B. nigra*; natural size. Fig. 2. *Plants and sporidia*, magnified.

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PERICHÆNA STROBILINA.

Fir-cone Perichæna.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI, Link.*

GENERIC CHARACTER.

Peridium papyraceum, regulare, persistens, simplex, læve, demum circumscissum. Flocci rari, immixti, liberi.

Peridium papyraceous, regular, persistent, simple, even, at length bursting transversely into two portions. Filaments few, free, lying among the sporidia.

SPECIFIC CHARACTER.

PERICHÆNA strobilina; *aggregata, peridiis rufo-fuscis, sporidiis sordide flavicantibus.*

P. aggregate, peridia reddish-brown; sporidia dull yellow.

PERICHÆNA strobilina, *Fries, Symb. Gasterom.* p. 11.

LICEA strobilina, *Alb. et Schwein.* p. 109. t. 6. f. 3.—*Swartz, in Vet. Ac. Handl.* 1815, p. 113. *fide Fries.*—*De Cand. Fl. Franç.* v. 6. p. 100.—*Sturm, Deutschl. Fl. (Fungi),* t. 20.—*Nees, Syst.* p. 28. t. 8. f. 101.

TUBIFERA strobilina, *Poir. fide Steudel, in Nomen. Bot.*

HAB. Between the scales of old half-decayed cones of *Pinus Abies.* Appin, Captain CARMICHAEL.

Plant produced within the scales of the cones, aggregated, crowded, subglobose, of a reddish-brown colour. *Sporidia* oval, of a dull pale yellow, copious, enclosing sporidiola. The *peridia* are apt to burst somewhat irregularly at first, but eventually are so far transversely divided as to leave the lower half, which remains for a long time after the sporidia have escaped.

This rare and fine species has been added to the British Flora by my indefatigable friend Captain CARMICHAEL, who finds it at Appin, on the west coast of Scotland. It is considered as of unfrequent occurrence, even on the Continent. ALBERTINI and SCHWEINITZ were the first to describe it.

Fig. 1. *One of the scales of a cone, with P. strobilina,* natural size. Fig. 2. *The same.* Fig. 3. *Two peridia,* Fig. 4. *Sporidia.* Fig. 5. *Sporidia and sporidiola;* magnified.

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276

PYRENIUM LIGNATILE.

Reddish-white Pyrenium.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—NAT. ORD. *GASTROMYCI?*

GENERIC CHARACTER.

Receptaculum subcarnosum, demum inflatum (cavum) contextu floccoso. Sporidia in ambitu nidulantia.—FRIES.

Receptacle somewhat carnose, at length inflated (hollow), of a filamentous texture. Sporidia imbedded in the circumference.

SPECIFIC CHARACTER.

PYRENIUM lignatile; *subglobosum, sæpissime sublobatum, albo-lateritium.*

P. subglobose, mostly somewhat lobed, reddish-white.

PYRENIUM lignatile, *Fries*, MS. *et Syst. Orb. Veg.* 1. p. 94.

HAB. On rotten wood, the trunks of dead trees, &c. Appin, Captain CARMICHAEL. I have also gathered it, but have omitted to record the station.

Plant gregarious, subglobose, sessile, entire or irregularly lobed, 2–3 lines in diameter, somewhat carnose, but distinctly floccose in its texture, reddish-white, perfectly hollow within. *Sporidia* numerous, subglobose, very minute, lying in the circumference among the filaments.

The genus *Pyrenium* was established by TODE in his *Fungi Mecklenburgenses*, 1790; but of the three species described by him, only one is considered to be a true *Pyrenium* by FRIES. The subject of the accompanying plate, however, has recently been added by the latter naturalist, and the specimens he kindly communicated to me have enabled me to ascertain that Captain CARMICHAEL's plant is the same species.

At first sight, *P. lignatile* is extremely like a *Sclerotium*, but its floccose substance removes it at once to the *Tremellini*,

where FRIES has placed it next to *Dacrymyces*, to which it bears a near affinity.

Fig. 1. *Pyrenium lignatile*, natural size. Fig. 2. *Plants of different forms, one of them divided, to shew the internal cavity.* Fig. 3. *A small portion of the receptacle.* Fig. 4. *Filaments and sporidia;* magnified.

277

LAMINARIA DEBILIS.

Dwarf Laminaria.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Frons fibrose radicata, stipitata, membranacea vel coriacea; fructus, granula pyriformia in lamina frondis, soros maximos formantia.—AGARDH.

Fronds stipitate, provided with fibrous radicles, membranaceous, or coriaceous: fructification, pyriform granules forming large *sori* in the substance of the frond.

SPECIFIC CHARACTER.

LAMINARIA debilis; *stipite setaceo in frondem membranaceam cuneato-oblongam dilatato.*

L. stipes setaceous, dilating into a membranaceous, oblong, somewhat wedge-shaped frond.

LAMINARIA debilis, *Ag. Sp. Alg.* 1. p. 120.—*Syst. Alg.* p. 273.—*Chalmers, Algæ Scot.*

FUCUS phyllitis, *var.* subsessilis, *Clem.* p. 312.

FUCUS bicornis, *Gmel. Hist. Fuc.* p. 192.

ULVA plantaginifolia, *Wulf.*
ULVA plantaginea, *Roth,* } *fide Agardh.*

TREMELLA marina, *Dill. Hist. Musc.* p. 46. t. 9. f. 4.??

HAB. Shores of the Western Isles of Scotland, Mr CHALMERS.

Plant tufted or aggregated. *Root* between scutate and fibrous. *Stipes* very short, as fine as a bristle, immediately expanding into an oblong, somewhat wedge-shaped frond, very obtuse at the extremity, which varies in being rounded, or more or less truncate, or even emarginate; the *margin* is entire, sometimes waved; the *substance* thin and membranaceous; the *colour* olivaceous, like the other *Laminariæ*. The fronds are inconstant in their proportions: in general they are 3–5 inches in length, and 1 to nearly 2 inches in breadth; but specimens sometimes occur, though rarely, of a nearly linear form.

For the acquisition to the British Flora of this very distinct species of *Laminaria*, we are indebted to Mr CHALMERS,

the author of a dried collection of well preserved specimens of Algæ, entitled "*Algæ Scoticæ*."

His specimens agree in every respect with authentic ones from Professor AGARDH himself, existing in the *Herbaria* of Dr HOOKER and myself.

The fructification I have not seen, nor indeed is AGARDH acquainted with it. That of *L. Phylittis* is equally unknown.

With this addition, the British *Laminariæ* amount to seven species: we may fully, I think, anticipate the discovery of an eighth, the *L. fascia* of AGARDH; and we have also on our coast a doubtful plant, which seems almost entitled to be admitted into the genus. I am by no means certain that the plant figured by DILLENIUS, and quoted both by AGARDH and myself, may not be this doubtful species. There is a figure in "English Botany," t. 2136. under the name of *Ulva plantaginea* of ROTH, which neither AGARDH nor LYNGBYE seem to be aware of; and I cannot but suspect that the subject of it will prove either a distinct species, or a more completely developed state of *Laminaria fascia*.

TAB. 277. *A group of fronds of L. debilis*, natural size.

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RADULUM ORBICULARE.

Circular Radulum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—*HYMENOMYCETES.*
ORD. I. PILEATI, *Fries.*

GENERIC CHARACTER.

Hymenium interruptum, hinc inde subulis tuberculosum.

Hymenium interrupted, here and there tuberculated with subulate processes.

SPECIFIC CHARACTER.

RADULUM orbiculare; *orbiculatum, resupinatum, albo-lutescens, margine byssino, aculeis difformibus, apicibus villosis.*

R. circular, resupinate, white, becoming yellowish, the margins byssoid, the processes irregular in form, villose at the apex.

RADULUM orbiculare, *Fries, Syst. Orb. Veg.* 1. p. 81.
HYDNUM Radula, *Fries, Obs. Mycol.* 2. p. 271.—*Syst. Myc.* v. 1. p. 428.
HYDNUM spathulatum, *Grev. Fl. Edin.* p. 406. *An Auct.?*

HAB. On the trunks of dead Birch-trees *(Betula alba)*. Autumn, winter, and spring. Appin, Captain CARMICHAEL. Auchindenny woods, near Edinburgh.

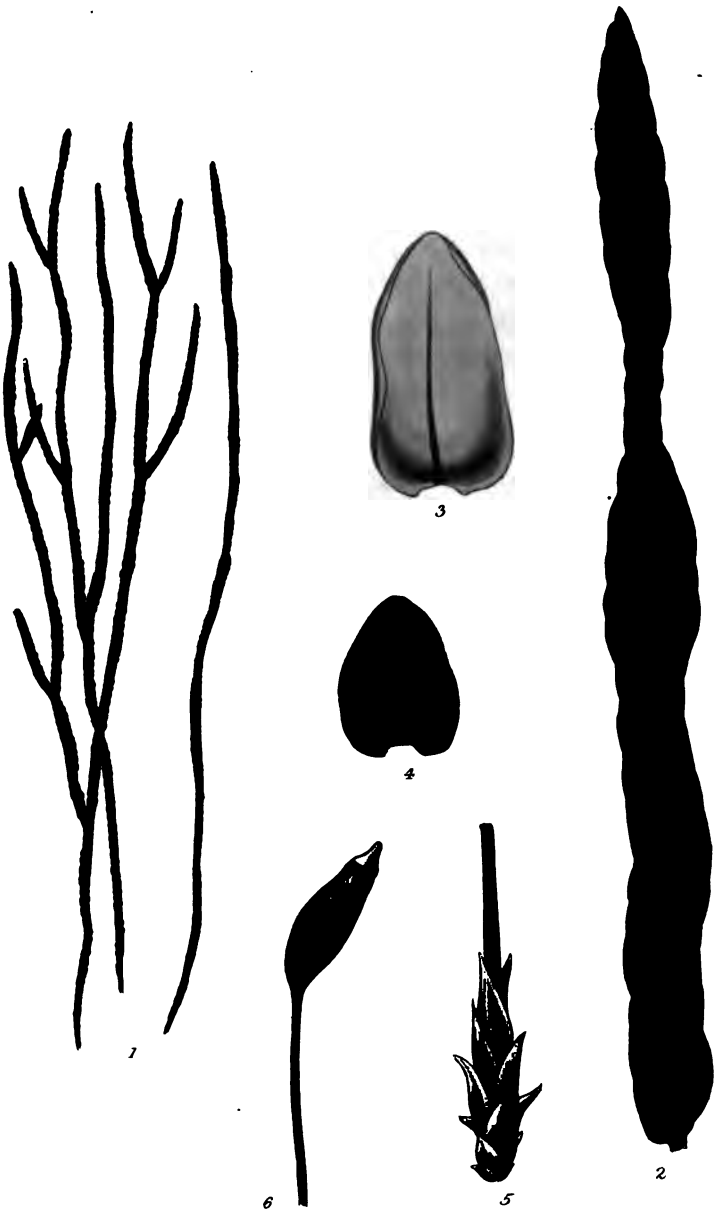
Pileus entirely resupinate, one to several inches in diameter, at first circular, afterwards irregular, and often confluent, of a white colour, mostly changing (especially in the centre) to a pale orange-yellow; margin filamentous, radiating, somewhat raised, or rather thickened. *Hymenium* composed of processes, irregularly distributed over the surface of the pileus, and more or less distant. They are singularly variable in their form, but are mostly 2–3 lines in length, slightly compressed, and somewhat broader at the apex than at the base. Often several are confluent, and altogether deformed. At their apex, they are generally entire, and sometimes naked, but more frequently villose. In regard to direction, I have seen them both erect and oblique, or even closely appressed.

So very near does this fungus range (in description at least) with *Hydnum spathulatum* of FRIES (*Sistotrema spathu-*

latum, PERS.), that both Captain CARMICHAEL and myself referred it at once to that species; nor was I aware of the error till I received authentic specimens from my friend M. FRIES himself. Still, I have not seen the true *Hydnum spathulatum*, and cannot help entertaining a suspicion, that the subject of the present description may be too nearly related to it.

Radulum is a genus proposed by FRIES, for receiving those *Hydna* which have an interrupted *hymenium*; the true *Hydna* having their subulate processes crowded and free. Another genus is also introduced by the same author, between *Hydnum* and *Radulum*; namely *Irpex*, in which the subulate processes are connected at their bases seriatim, or by a kind of net-work. *Hydnum* and *Irpex* are connected by *Radulum* with *Thelephora*, one or two species of which more properly belong to it than to the latter; especially the one cited by FRIES, *Thel. hydnoidea*.

Fig. 1. *Radulum orbiculare*, natural size. Fig. 2. *A young plant.* Fig. 3. *Processes of the hymenium.* Fig. 4. *Extremities of two processes.* Fig. 5. *Sporidia*; magnified.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HYPNUM TRIFARIUM.

Trifarious Hypnum.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT ORD. *MUSCI, Juss.*

GENERIC CHARACTER.

Seta lateralis. Peristomium duplex: ext. *e dentatibus* 16: int. *membrana plicata,* 16-*laciniata, ciliis alternantibus. Calyptra dimidiata.*—HOOK.

Fruitstalk lateral. Peristome double: the outer one of 16 teeth; the inner one of a plicate membrane, cleft into 16 segments, with ciliary processes between them. Calyptra dimidiate.

SPECIFIC CHARACTER.

HYPNUM trifarium; *caulibus subsimplicibus, elongatis, foliis ovatis obtusis integerrimis, trifario-imbricatis, suberectis, tumido-concavis, nervo apicem versus evanescenti.*

H. stems nearly simple, elongated, leaves ovate, obtuse, entire, trifariously imbricated, suberect, tumid and concave, with a nerve disappearing towards the extremity.

HYPNUM trifarium, *Web. et Mohr, It. Suec.* p. 177. t. 2. f. 2.—*Ejusd. Tasch.* p. 319.—*Brid. Musc. Suppl.* 2. p. 127.—*Meth.* p. 161.—*Wahl. Fl. Lapp.* ed. 2. p. 701.—*Funck, Deutschl. Moose,* p. 57.

HYPNUM stramineum, *var. β, Schwaegr. Sp. Musc.* II. p. 212. t. 89.

HYPNUM uliginosum, *Schleich. Cent.* 3. No. 54. *fide Schwaegr.*

HAB. Moist bogs and peat-holes on Ben Hallum and Ben Lawers, 1824.

Stems slender, 3 inches to a foot or more in length, nearly simple, or bearing one or two branchlets about half an inch long; varying in colour from a rich brownish-purple to green. *Leaves* broadly ovate, very obtuse, with an entire margin, extremely concave, and, as it were inflated, closely imbricated in a suberect position, and distinctly arranged on three sides of the stem. They are furnished with a single nerve, reaching at least two-thirds of their length. *Leaves* of the *perichætium,* according to SCHWAEGRICHEN's figure, closely imbricated (the summits of the outer ones spreading), nerved, and oblong-lanceolate. *Fruitstalk* smooth; *capsule* almost cylindrical, somewhat cernuous; the *lid* conical.

"Pulcherrimus muscus et distinctissimus," is an expression applied by WEBER and MOHR to this plant, from which I

am not inclined to dissent. With *Hypnum stramineum* alone is any confusion likely to arise, particularly in this country; for the creeping stems of *H. molle* and *H. alpestre* separate them at once, independently of other characters. Nothing can be more manifest than the beautifully distinct trifarious arrangement of the leaves in all the specimens which have come under my observation; and though it sometimes happens that this uniformity is apparently destroyed, by the occasional twisting of the stem, it is restored immediately by artificially untwisting it. In *H. stramineum*, on the contrary, the leaves are far more numerous, and irregularly as well as more loosely imbricated; they are besides more spreading, longer, and narrower, far less concave, less broadly obtuse, and provided with a much shorter nerve. In regard to colour, I do not think any stress can be laid on that character. *H. stramineum* I have seen of a pure though pale green; and if WAHLENBERG be correct, a singular difference exists between the *H. trifarium* of Sweden and that of Scotland; the former being, according to him, greener than *H. stramineum*, while the latter, (the *H. trifarium* of Scotland), has exhibited a deep brownish-purple, in three several localities.

I regret that it has not been in my power to represent British fructification; and not possessing even foreign fertile specimens, I have copied SCHWAEGRICHEN's figure of the perichætium and capsule. Without, however, deriving any additional character from the fruit, there appear to me abundant marks of discrimination.

Fig. 1. *Hypnum trifarium*, natural size. Fig. 2. *Upper portion of a stem.* Fig. 3. *Upper leaf.* Fig. 4. *Lower leaf.* Fig. 5. *Perichætium.* Fig. 6. *Capsule;* magnified.—*The two last figures borrowed from Schwaegrichen.*

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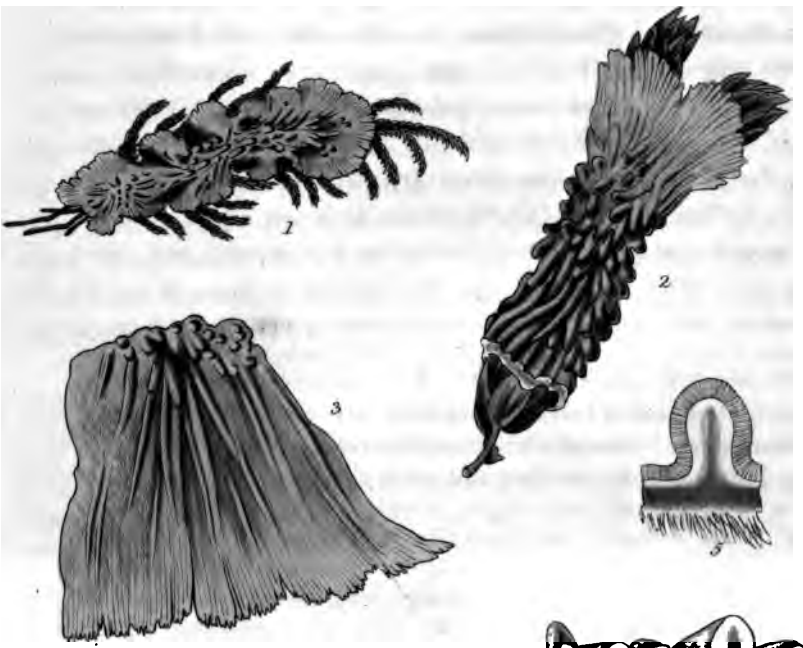
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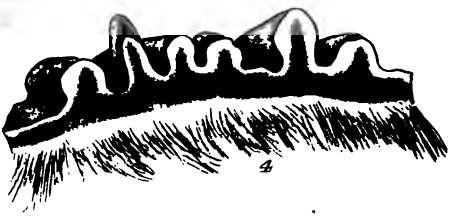
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PHLEBIA Merismoides.

Orange-bordered Phlebia.

Class and Order CRYPTOGAMIA FUNGI, *Linn.*—*HYMENOMYCETES.* —Ord. I. PILEATI, *Fries.*

GENERIC CHARACTER.

Hymenium cum pileo homogeneum, vage vel interrupte plicatum, rugis prominentibus cum hymenio undique ascigeris. Asci immersi. Sporidia albida.

Hymenium homogeneous, with the pileus irregularly or interruptedly plicate, the folds prominent, covered every where, as well as the hymenium, with fructification. Asci immersed. Sporidia white.

SPECIFIC CHARACTER.

Phlebia Merismoides; *effusa, carneo-rubra, subtus villosa alba, margine aurantiaca pilosa, plicis rectis.*

P. effused, flesh-colour, villose and white beneath, margin orange colour, pilose, folds of the hymenium straight.

Phlebia Merismoides, *Fries, Syst. Myc.* v. 1. p. 427.
Merulius Merismoides, *Fries, Obs. Myc.* 2. p. 235.

Hab. Trunks of dead trees, frequently intermixed with Mosses; rare. Autumn and winter. Swanston wood, near Edinburgh.

Pileus carnose, not a line in thickness, either growing upon the bark itself, or (more frequently) spreading for two or three inches over the mosses upon it, especially near the ground; often completely enveloping their stems, in which state it bears no inconsiderable resemblance to a stalactitical incrustation. The colour is more or less orange, or red; that in the centre becoming more and more dull as the plant grows older, but the margin is delicate and very bright; beneath, the pileus is whitish and downy. The surface of the hymenium partly depends upon the subjacent body; but it is always more or less either tuberculated or folded; when growing on mosses, the folds or rugæ often pass into prominent or somewhat elongated *papillæ;* when the subjacent surface is plane, the rugæ are more perfectly developed, and pass towards the circumference in a tolerably direct manner. The margin is byssoid, as in the genus *Merisma.* *Asci* linear, containing 1–4 globose white *sporidia.*

In this very beautiful little fungus, I have also the pleasure of introducing a new British genus to the botanist, containing at least two native species; for, within a few hours—(since commencing the MS. for the present Number), I have received from my friend Captain CARMICHAEL fine specimens of *Phlebia radiata*, FRIES.

FRIES has observed, with great justness, that although the characters of the genus bring it near to *Cantharellus*, yet the habit is that of *Auricularia*.

A genus named *Ricnophora* has been published by PERSOON in the second part of his Mycologia Europæa. He describes only one species, and names it *R. carnea*, though he is of opinion *Phlebia radiata* and *P. contorta* of FRIES will prove only to be varieties of it. Our present plant and *Phlebia vaga*, he dismisses from his own genus, and thinks that the one proposed by FRIES may be retained for their sake; but at the same time he professes to be unacquainted with the plants. Having, however, examined authentic specimens of *Ricnophora carnea*, PERS. communicated to me by my esteemed friend Dr MOUGEOT; and specimens of *Phlebia Merismoides*, bestowed by FRIES himself, I do not find any reason to keep them in distinct genera. The prior name given by M. FRIES must of course be retained.

Fig. 1, 1. *Phlebia Merismoides*, natural size. Fig. 2. *A branch of moss invested by the fungus.* Fig. 3. *A portion of the pileus.* Fig. 4. *A vertical section of the pileus.* Fig. 5. *One of the papillæ divided.* Fig. 6. *Asci and sporidia;* magnified.

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STILBUM TOMENTOSUM.

Minute parasitic Stilbum.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—*CONIOMYCETES.*
ORD. II. MUCORINI, *Fries.*

GENERIC CHARACTER.

Peridiolum fugax, capituliforme, cum sporidiis immersis confluens, gelatinosum, diffluens. Stipes æqualis, farctus.

Peridiolum fugacious, forming a little head, confluent with the immersed sporidia, gelatinous, melting away. Stipes equal, solid.

SPECIFIC CHARACTER.

STILBUM tomentosum; *album, parasiticum, peridiolo globoso, stipite glanduloso.*

ST. white, parasitical, the peridiolum globose, the stipes set with small glands.

STILBUM tomentosum, *Schrad. Journ. Bot.* v. 2. p. 65. t. 3. f. 1.—*Pers. Syn. Fung.* p. 680.—*Alb. et Schwein.* p. 352.—*Schwein. Fung. Carol. Supp.* No. 1276.—*Sturm, Deutschl. Fl. (Fungi)*, t. 46.

HAB. On several species of *Trichia*, &c. On *Trichia nitens* in Glenfinlas. The Rev. M. J. BERKELEY.

Plant gregarious, wholly white, about a line in height, fixed to the *trichia* by a minute fimbriated base. *Little head* or *peridiolum* globose, opaque (sometimes pellucid according to some authors), glabrous, confluent with the sporidia, deliquescing on the application of moisture. *Stipes* solid, opaque, slender, equal, set with minute, pellucid, roundish processes or glands. *Sporidia* very minute, globose.

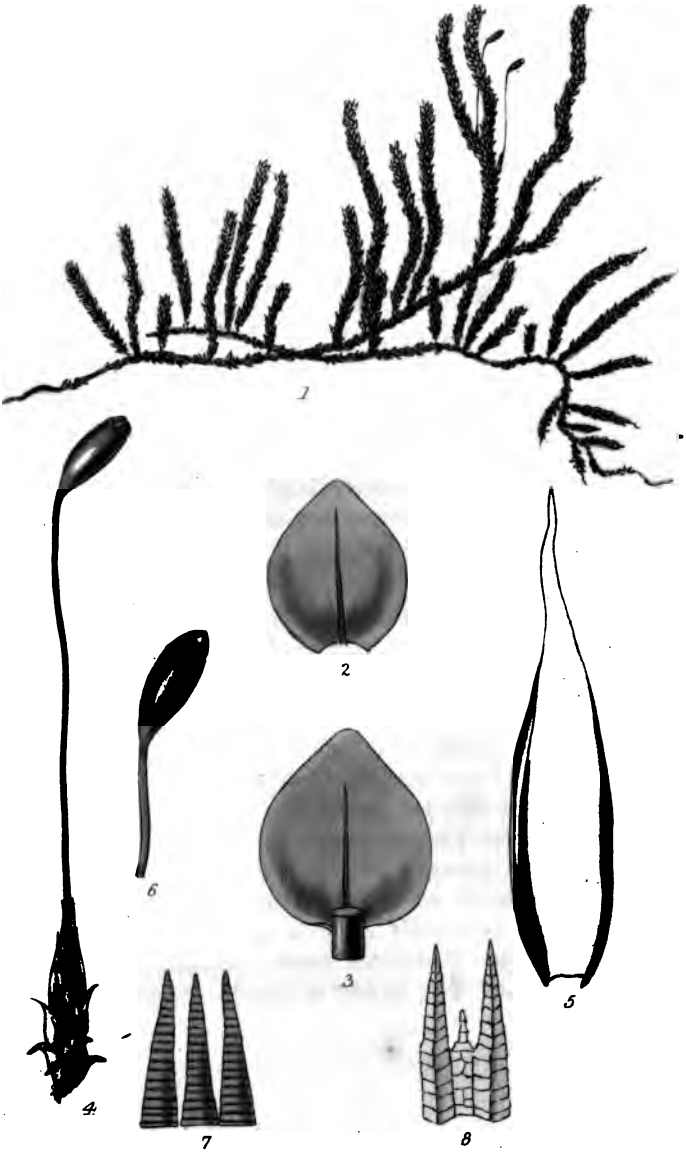
A pretty little species of *Stilbum*, discovered to be a native of Britain by the Rev. M. J. BERKELEY, an eager and successful investigator of cryptogamous vegetables.

The genus *Chordostylum* of TODE is distinguished from *Stilbum*, by its powdery deciduous peridiola, and unequal stipes.

I have retained the specific name appropriated to this plant by SCHRADER, and subsequent botanists, though nothing can

be less characteristic. It is true, that in some specimens a fine delicate mucor-like substance is said to envelope the whole plant; but *that* is an extraneous appendage. In its natural state, it is completely destitute of any such appearance.

Fig. 1. *Stilbum tomentosum on Trichia nitens,* natural size. Fig. 2. *A group of plants.* Fig. 3. *Plants in different stages.* Fig. 4. *Peridiolum and part of the stipes;* magnified.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HYPNUM ALPESTRE.

Mountain aquatic Hypnum.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss.*

GENERIC CHARACTER.

Seta lateralis. Peristomium duplex: ext. *e dentibus* 16: int. *membrana plicata,* 16-*laciniata, ciliis alternantibus. Calyptra dimidiata.*—HOOK.

Fruitstalk lateral. Peristome double: the outer one of 16 teeth; the inner one of a plicate membrane, cleft into 16 segments, with ciliary processes between them. Calyptra dimidiate.

SPECIFIC CHARACTER.

HYPNUM alpestre; *caulibus repentibus, ramis erectis subsimplicibus; foliis imbricatis, patentibus, late ovatis, integerrimis, obtusis,* 1- *vel* 2-*nervibus, rigidiusculis; theca oblonga, cernua, operculo conico.*

H. stems creeping, branches erect, nearly simple, leaves imbricated, spreading, broadly ovate, entire, obtuse, 1- or 2-nerved, somewhat rigid, capsule oblong, the lid conical.

HYPNUM alpestre, *Swartz, Musc. Suec.* p. 102. t. 6. f. 15.—*Hedw. Sp. Musc.* I. p. 247. t. 44. f. 1,-4. et *Schwaegr. in Sp. Musc.* II. p. 220.—*Funck,* —*Deutschl. Moose,* p. 58. *(specim. caret).*—*Brid. Suppl. Musc.* II. p. 129. —*Wahl. Fl. Lapp.* p. 701. *quoad syn. Sw. et Hedw.*

HAB. Mountain rivulets. Ben Hallum, 1824.

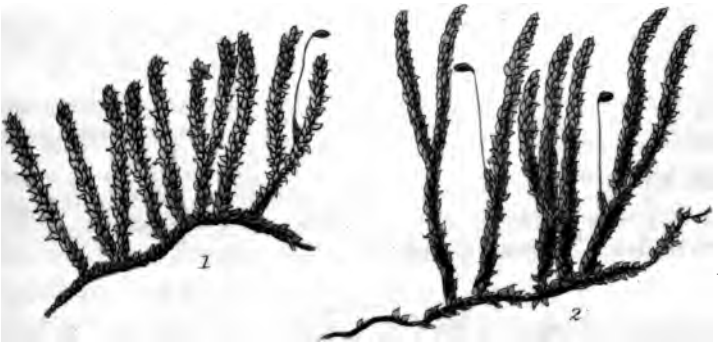
Plant covering the rocks, chiefly in the more rapid parts of streams, to a considerable extent. *Stems* creeping, thickly entangled, divided, throwing up numerous branches, 1–3 inches in length, sometimes floating, but more frequently nearly erect, mostly simple, obtuse at the extremity. *Leaves* broadly ovate, obtuse, entire, concave, somewhat rigid, spreading, and imbricated on all sides of the stem; furnished with either a single nerve reaching two-thirds of the length of the leaf, or with two variable shorter nerves. *Perichætial leaves* nerveless, lanceolate, attenuated. *Fruitstalk* about half an inch in length. *Capsule* oblong, cernuous, the *lid* conical.

The following notice from BRIDEL exactly states the discrepancies connected with the accounts of this moss: "Planta multis dubiis et ambagibus vexata, de qua non visa nihil dicam cum descriptio et icon Hedwigianæ a Swartzianis ita dissentiant, ut vix credas eamdem stirpem illos præ oculis habuisse.

HEDWIGIUS etenim capsulam subpyriformem cernuam, SWARTZIUS vero urceolatam erectam sistit, ille folia uninervia, hic enervia dicit. WEBER et MOHR autem folia binervia esse affirmant, et ab *Hypno molli* auctorum minime separant. Sententiam ferre non audeo."

It is greatly to be regretted that we have not more original examinations of this species to consult. HEDWIG figured it from SWARTZ's specimens; and of these two authors, as we have seen, one finds the leaves nerveless, the other provided with a single nerve. Then come WEBER and MOHR, who unite it to *Hypnum molle*, and maintain that SWARTZ's plant, instead of being nerveless, or 1-nerved, is really 2-nerved; and in this they are correct, as I have myself ascertained. I do not possess the Fasc. Crypt. of DICKSON; but WEBER and MOHR say there can be no doubt that his *H. molle* is precisely the same as *H. alpestre* of SWARTZ; yet, as it were, to carry confusion a little farther, he is said to have given to the leaves a single excurrent nerve. SCHWAEGRICHEN, in Sp. Musc. II. terms the leaves in the specific character *semibinervia*,—quotes WEBER and MOHR as authority for the species (after HEDWIG), though they have it not, and makes no observation upon the Hedwigian figure, representing the leaves as 1-nerved. Again, WEBER and MOHR are not correct in saying the nerves of their *H. molle* are one-third the length of the leaf, as I have seen them both two-thirds, and so short as scarcely to be perceived at all. In my own figure, I have drawn the leaves with a rather long and firm single nerve, such as I have *always* observed in Scottish and Swiss specimens. The fructification I have been obliged to borrow from the latter, as I have not had the good fortune to meet with it in this country. May not, after all, the *H. alpestre* of SWARTZ be a distinct species from the *H. alpestre* now represented? Or is the peculiar appearance of the former derived from local circumstances; such as growing by the side of streams, instead of on the rocks forming their bed?

Fig. 1. *Hypn. alpestre,* natural size. Fig. 2. *Lower leaf from the branches.* Fig. 3. *Upper leaf.* Fig. 4. *Perichætium, with fruitstalk and capsule.* *Fig. 5. Perichætial leaf.* Fig. 6. *Capsule, with the operculum;* magnified.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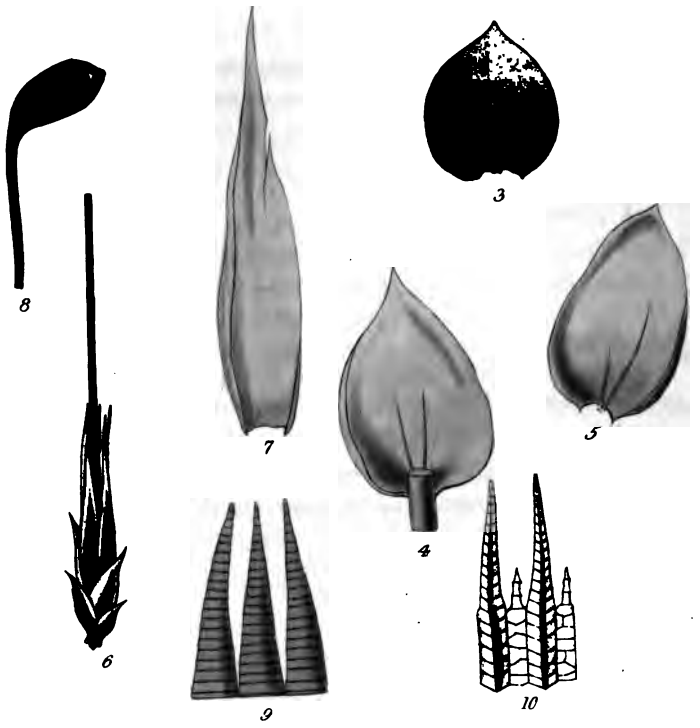
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HYPNUM MOLLE.

Soft-leaved aquatic Hypnum.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss.*

GENERIC CHARACTER.

Seta lateralis. Peristomium duplex: ext. *e dentibus* 16: int. *membrana plicata,* 16-*laciniata, ciliis alternantibus. Calyptra dimidiata.*—HOOK.

Fruitstalk lateral. Peristome double: the outer one of 16 teeth; the inner one of a plicate membrane, cleft into 16 segments, with ciliary processes between them. Calyptra dimidiate.

SPECIFIC CHARACTER.

HYPNUM molle; *caulibus repentibus, ramis erectis, subsimplicibus; foliis laxe patentibus, summitate ramorum subsecundis, late ovatis, integerrimis, acutiusculis, flaccidis,* " 1- *vel*" 2-*nervibus; theca ovata, cernua, operculo conico.*

H. stems creeping, branches erect, nearly simple; leaves loosely spreading, subsecund at the top, broadly ovate, entire, rather acute, flaccid, " 1- or" 2-nerved; capsule ovate, cernuous, the lid conical.

HYPNUM molle, *Dicks. Pl. Crypt.* fasc. 2. t. 5. f. 8, *fide Hook. et Tayl.—Hedw. Sp. Musc.* I. p. 273. t. 70. f. 7,-10.—*Schwaegr. in Sp. Musc.* II. p. 220.—*Web. et Mohr, Tasch.* p. 340.—*Smith, Fl. Brit.* v. 3. p. 1312.—*Eng. Bot.* t. 1992. *male.*—*Compend.* ed. 4. p. 196.—*With. Bot. Arr.* v. 3. p. 1107.—*Funck, Deutschl. Moose,* p. 58. t. 40.—*Brid. Musc. Supp.* II. p. 129.—*Hook. et Tayl. Musc. Brit.* p. 95. t. 24. *excl. syn. H. alpestris.—Fl. Scot.* Pt. 2. p. 142.—*Hobs. Musc. Brit.* v. 2.—*Moug. et Nestl. St. Crypt. Exsicc.* No. 730.—*Drumm. Musci Scot.* v. 2. No. 64.

HYPNUM alpestre, *Wahl. Fl. Lapp.* ed. 2. p. 701. *quoad syn. H. mollis.*

HYPNUM rupestre, *Schleich. fide Schwaegr.*

HAB. The rocky beds of mountain rivulets. Scotland, DICKSON. Ben Nevis, Messrs HOOKER and BORRER. In the counties of Angus, Aberdeen, and Inverness, G. DON. Argyleshire, Captain CARMICHAEL. Clova Mountains, Mr DRUMMOND.

Plant forming a close covering to the rocks in the beds of alpine rivulets. *Stems* creeping, entangled, closely attached to the rock, throwing up numerous branches about an inch or an inch and a half in height, mostly simple, erect. *Leaves* loosely imbricated, soft and flaccid, unequally spreading, towards the summit of the branches generally more or less secund, broadly ovate, with a somewhat pointed termination, entire, concave, " 1- or" 2-nerved. *Perichætial leaves* nerveless, lanceolate, attenuated. *Fruitstalk* somewhat more than half an inch in length. *Capsule* ovate, cernuous, dark brown; the *lid* shortly conical.

The representation of this moss in "English Botany," is so little characteristic, that I have not hesitated to give it a place in the present work; more particularly as I am desirous of placing it in immediate contrast with *Hypnum alpestre*. In regard to the nerve in the leaf, less confusion exists than in *H. alpestre*, yet there is a good deal of inconsistency. HEDWIG describes the leaf as nerveless, and Sir JAMES SMITH does the same in the last edition of the "Compendium." DICKSON is said to figure a single nerve: BRIDEL says it is "obsolete binerve;" SCHWAEGRICHEN "semi-binerve." HOOKER and TAYLOR affirm it to be either faintly 2-nerved at the base, or to have a single short nerve. From my own experience in the examination of numerous Scottish, French, and Swiss specimens, I am inclined to join WEBER and MOHR in characterizing it as only 2-nerved; and in doing so, I conjecture that those specimens in which the leaf has been described as 1-nerved, belong to *H. alpestre*. I may here observe, that, in habit, the *H. alpestre* of SWARTZ (which is 2-nerved), is intermediate between the *H. alpestre* of this work and *H. molle;* and if the leaf with its nerve were taken as the leading character, it would be united to the last-named species; and the *H. alpestre* I have figured, would remain distinguished by a single nerve, as long and as strong as that of *H. molle* is short and weak.

The colour of this species is sometimes altogether pale, with a reddish tinge at the top and at the base: in other cases (as in the specimens from the Clova Mountains), it is pale at the summit, and dark lurid or even blackish-green below. Colour, however, affords no mark of distinction. It is chiefly separated from *H. alpestre* by its flaccid texture, the loose, irregular imbrication of the leaves, and their mostly secund direction at the upper part of the plant. The capsule is also more cernuous, and much thicker and rounder.

Figs. 1, 2. *H. molle*, natural size. Fig. 3. *Lower leaf of the branches.* Figs. 4, 5. *Upper leaves.* Fig. 6. *Perichætium.* Fig. 7. *Perichætial leaf.* Fig 8. *Capsule.* Fig. 9. *Teeth from the outer peristome.* Fig. 10. *A portion of the inner peristome;* magnified.

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GRIMMIA LEUCOPHÆA.

Dark hoary Grimmia.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss.*

GENERIC CHARACTER.

Seta terminalis. Peristomium simplex e dentibus 16 *integris vel perforatis (rarissime fissis) æquidistantibus. Calyptra mitriformis.*—HOOK.

Fruitstalk terminal. Peristome simple, of 16 entire or perforate (rarely cleft) equidistant teeth. Calyptra mitriform.

SPECIFIC CHARACTER.

GRIMMIA leucophæa; *effuso-cæspitosa; caulibus brevibus, subsimplicibus; foliis patentibus, ovatis, acumine incano, longissimo, productis; seta recta, vix exserta; theca ovata, operculo brevi-rostrato.*

G. in spreading tufts; stems short, nearly simple; leaves spreading, ovate, with a very long hoary acumination; fruitstalk straight, scarcely exserted; capsule ovate, the lid shortly rostrate.

GRIMMIA leucophæa, *Grev. in Wern. Trans.* v. 4. p. 87. t. 6.—*Grev. Fl. Edin.* p. 235.—*Hobson, Musci Brit.* v. 2.—*Drumm. Musci Scot.* v. 2. No. 30.

CAMPYLOPUS lævigatus, *Brid. Meth.* p. 76.?

DICRANUM piliferum, *Schleich. fide Arnott.*

HAB. Subalpine rocks. Near Newburgh, Fifeshire, Mr DRUMMOND. Rocks on the coast of Fife, Mr WALKER ARNOTT. King's Park, Edinburgh, abundantly.

Plant at first growing in round tufts, but rapidly spreading, till the rocks are covered with one uniform mass, often to a considerable extent; of a dark green colour, and in dry weather appearing almost black, beneath the silvery hoariness of the leaves. *Stems* about half inch in height, nearly simple, erect, naked towards the base. *Leaves* imbricated on all sides, spreading, ovate, nerved, dull green; the upper ones produced at their extremity into a diaphanous, shining, serrulate, hair-like point, at least thrice as long as themselves; in the lower ones, the diaphanous point becomes gradually shorter. *Fruitstalk* straight, so short as not to elevate the capsule above the summits of the hair-points of the leaves. *Capsule* ovate, dark reddish-brown, even; the *lid* varying from nearly conical to shortly rostrate. *Teeth* of the *peristome* fine red, rather short, perforated.

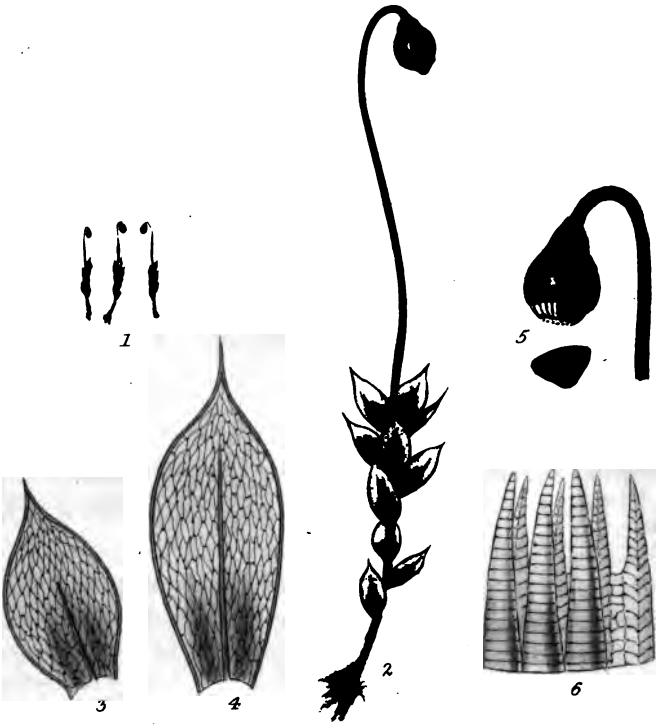
In the Transactions of the Wernerian Society, I have shown that there are only two species of *Grimmia* with which the subject of the present description can be confounded, namely, *G. campestris* of BURCHELL and HOOKER, and *Campylopus (Grimmia) lævigatus* of BRIDEL. From the former of these, *G. leucophæa* is distinguished, by its more simple stem, its narrower leaves and much shorter acumination; by the shorter fruitstalk, and by the teeth of the peristome being perforated and not cleft.

With *Campylopus lævigatus*, it has more points in common; but the description of that moss does not warrant my referring to it the species in question. The two characters, "*pedunculis subarcuatis*," and "*folia erecta*" ascribed by BRIDEL to his plant, are directly opposed to mine. Should they, however, indeed be the same, it cannot be wondered that, with so imperfect a description before me, I prefer rather to establish a species, accompanied with a figure, than to run the chance of adding to confusion.

Grimmia leucophæa, in spreading over the rocks, not unfrequently extends itself in a circular manner, and, like *Orthotrichum Drummondii*, and many Lichens, dies and disappears in the centre, while the circumference is enlarging, and in full vigour. When growing, I am not acquainted with any moss which possesses so peculiar and striking an appearance.

Specimens from the Vosges have recently been communicated to me by Dr MOUGEOT.

Figs. 1, 2. *G. leucophæa*, natural size. Fig. 3. *A single plant.* Fig. 4. *A leaf.* Fig. 5. *Capsule with calyptra.* Fig. 6. *Capsule with operculum.* Fig. 7. *Operculum of a different form.* Fig. 8. *Teeth from the peristome.* Fig. 9. *Sporules;* magnified.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BRYUM Tozeri.

Minute diaphanous Bryum.

CLASS AND ORDER CRYPTOGAMIA MUSCI, *Linn.*—NAT. ORD. *MUSCI, Juss.*

GENERIC CHARACTER.

Seta terminalis. Peristomium duplex: ext. *e dentibus* 16: int. *membrana plicata* 16-*laciniata, sæpissime ciliis alternantibus. Calyptra dimidiata.*—HOOK.

Fruitstalk terminal. Peristome double; the exterior of 16 teeth; the interior of a membrane divided into 16 segments, mostly alternating with filiform processes. Calyptra dimidiate.

SPECIFIC CHARACTER.

BRYUM Tozeri; *caule brevi simplici, erecto; foliis remotis, patentibus, obovatis, integerrimis, cuspidatis, marginatis, laxe reticulatis, nervo ultrà medium evanescenti; theca nutante subpyriforme.*

B. stem short, simple, erect; leaves remote, spreading, obovate, entire, cuspidate, margined, loosely reticulated, the nerve vanishing beyond the middle; capsule nodding, somewhat pear-shaped.

HAB. Clay banks by the river Dart, Devonshire, Rev. J. S. TOZER.

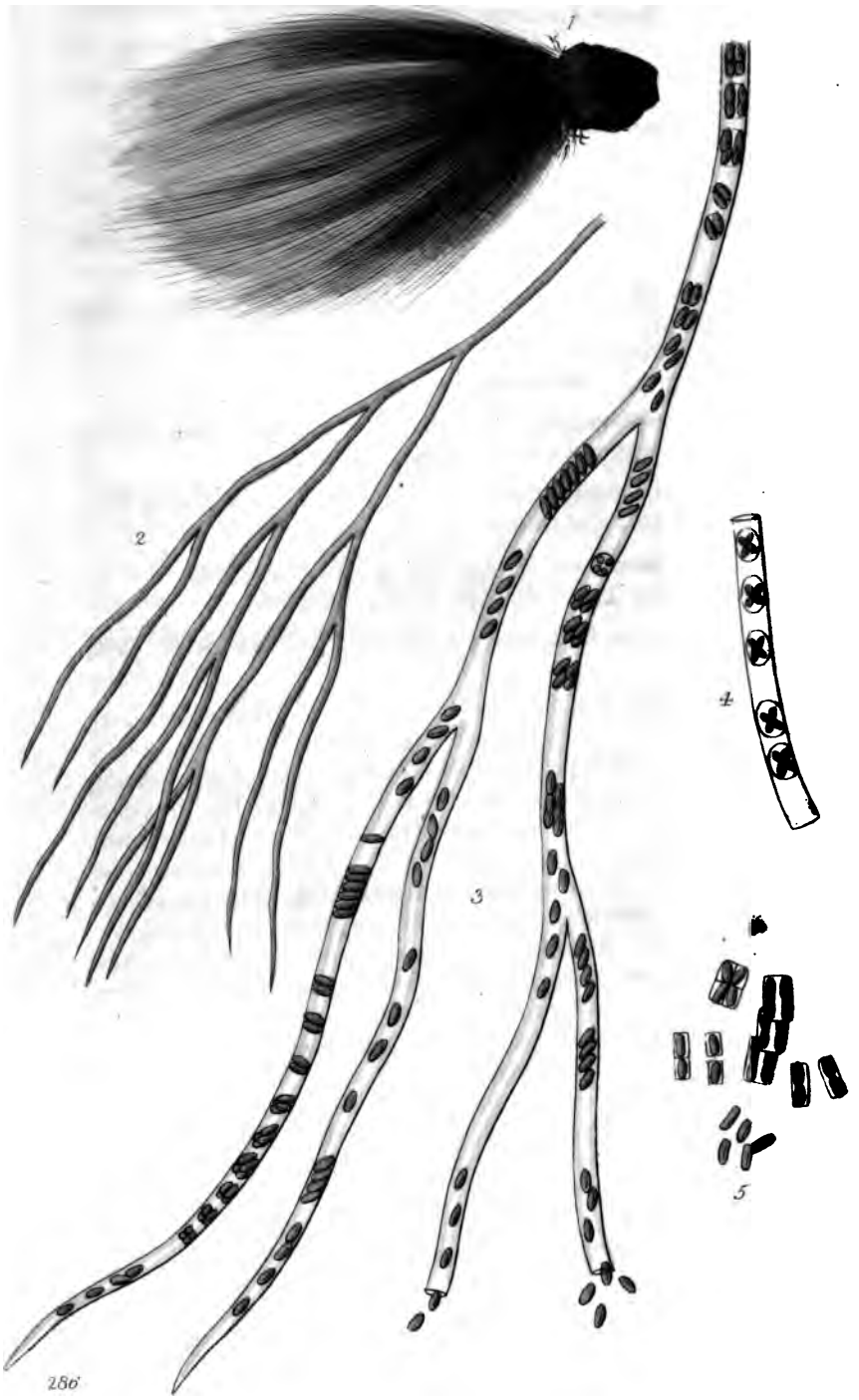
Plant scattered, altogether not more than half an inch in height. *Stem* naked below, very slender. *Leaves* spreading, remote, not more than 6–8, of a pale reddish colour, obovate, entire, cuspidate, margined, and of a most delicate loosely reticulated structure, nerve rather strong; in the upper leaves extending about two-thirds of their length, in the lower ones vanishing about the middle. The margin and the nerve are of a dark red colour. *Fruitstalk* a quarter of an inch in length. *Capsule* small, dark brown, obovate, or somewhat pyriform, nodding; the *lid* convex-conical. *Teeth* of the outer peristome yellow, as long as the inner peristome, which has no (?) ciliary processes between the segments.

For introducing into this work a plant only observed in England, I have deviated from my rule, hitherto strictly observed, of illustrating Scottish botany only. Every path in England, however, has been so assiduously explored, that when a new plant, so high in the scale of vegetation as a Moss, is

discovered, considerable interest is excited; and I therefore feel persuaded that my readers will be gratified by the publication of *Bryum Tozeri*.

My friend Mr TOZER, to whom we owe the knowledge of its existence, and from whom I received specimens, accompanied with a sketch and very accurate description, informs me that he found it on a moist bank, composed of a mixture of sand and clay, by the river Dart, about four miles above Totness. He observes, what indeed every practical bryologist will acknowledge, that, to the naked eye, it strongly resembles *Bryum carneum* in habit; while, under the microscope, no species can be farther removed in its foliage from that moss. It is not difficult to decide that it is one of the most distinct of British species; and I have in vain searched for any thing like it in bryological works. Such being the case, I rejoice in being able to bestow upon it the name of my indefatigable friend, who is also known to have distinguished himself by finding *Schistostega pennata*, after it had apparently disappeared for many years.

Fig. 1. *B. Tozeri*, natural size. Fig. 2. *A single plant.* Fig. 3. *Lower leaf.* Fig. 4. *Upper leaf.* Fig. 5. *Capsule and operculum.* Fig. 6. *A portion of the outer and inner peristome;* magnified.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MONEMA QUADRIPUNCTATUM.

Common Monema.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila libera, continua, tubulata capillaria, granula oblonga vel subelliptica includentia.

Filaments free, continuous, tubular, capillary, containing oblong or subelliptical granules.

SPECIFIC CHARACTER.

MONEMA quadripunctatum; *filis ramosis, cæspitosis, granulis oblongis primo matrice hyalina 4-aggregatis, demum sparsis, distinctis.*

M. filaments branched, tufted, the granules oblong, at first united by fours in a hyaline receptacle, at length scattered, distinct.

SCHIZONEMA quadripunctatum, *Ag. Syst. Alg.* p. 10.—*Carm.* MSS.
BANGIA quadripunctata, *Lyngb. Hydroph. Dan.* p. 86. t. 26.

HAB. On small stones, &c. in the sea. Appin, Captain CARMICHAEL. Frith of Forth.

Tufts flaccid, entangled, 1–3 inches in length. *Filaments* continuous, very slender, irregularly or somewhat dichotomously branched, attenuated at the extremity, of a dull yellowish or brownish-green colour, shining when dried. *Granules* in the young state in groups of four together, each group placed in a star-like manner in the centre of a transparent oval matrix or receptacle, and appearing like four dots, whence the specific name. In advancing towards maturity, the little receptacles enlarge, and grow somewhat quadrate: their contents, from a globular form, become ovate. At length the granules often assume a longitudinal direction in the receptacles, two being arranged end to end on each side, and in this manner sometimes escape from the filament. But more frequently the receptacles divide either longitudinally into two portions, or, by a transverse division also, into four, setting the oblong full-sized granules at liberty. In the same filament, numerous arrangements of the granules occur, as they are more or less independent, and associated in their progress towards some outlet. *Substance* of the filaments thin, membranous, tenacious.

Notwithstanding the labours of AGARDH and of LYNGBYE, the minute and obscure tribes of *Algæ* require much in-

vestigation. We can at present (and it is the opinion of AGARDH himself) scarcely venture to form the genera upon distinct and positive characters. Much, however, has been done already; and the broad view which AGARDH has taken of the whole Order, must eventually throw each plant into its proper place. But at present it is not surprising that practical investigators of the *Algæ* should be frequently involved in perplexity. Such is the case with my friend Captain CARMICHAEL and myself, in regard to the plants referable to the three genera *Schizonema*, *Gloionema*, and *Hydrurus*. It appears to us, that the filaments of *Schizonema 4-punctata* and *S. Dillwynii*, are truly branched like any other capillary *Algæ*, and of a simple structure throughout; so that they cannot enter into the genus *Schizonema*, as defined by my friend AGARDH. On the other hand, *Schizonema Smithii*, AG., according to the observations of Captain CARMICHAEL, is a filiform mass of gelatine, apparently quite destitute of tube, but composed of several slender agglutinated threads, separating at the extremity, and each containing a single series of granules. This plant, therefore, is a real *Schizonema*. For such other Agardhian species as have a simple structure, I propose the generic name of *Monema*; a division which I conceive will greatly facilitate the study of these algæ. The filaments of *Monema* never really divide like those of *Schizonema*; for even when they sometimes appear to be in a state of longitudinal coalescence, they are only in juxtaposition, as represented in DILLWYN's figure of *Conferva fœtida*.

Fig. 1. *M. quadripunctatum*, natural size. Fig. 2. *Filaments.* Fig. 3. *Portion of a filament with granules.* Fig. 4. *Appearance of the granules before maturity, borrowed from Lyngbye.* Fig. 5. *Granules, as they appear after escaping from the filaments;* magnified.

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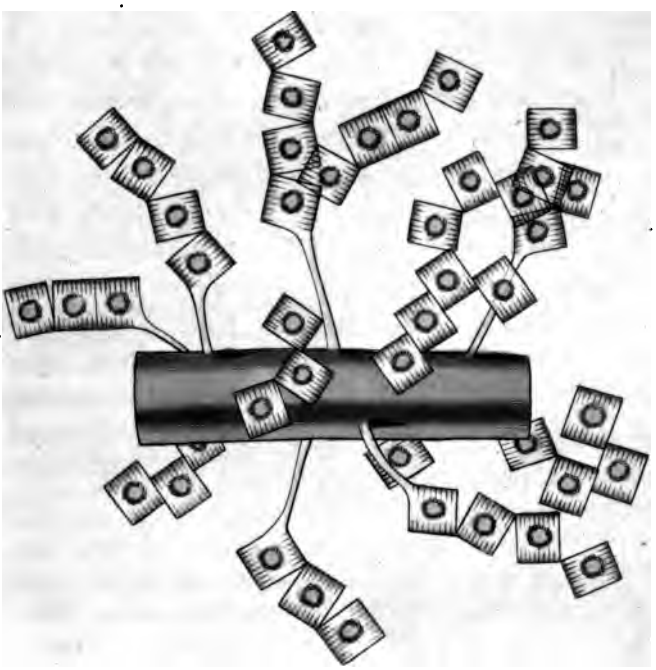

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ACHNANTHES UNIPUNCTATA.

Single-spotted Achnanthes.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Corpuscula plana, articulata, stipitata, vexilliformia, articulis secedentibus.

Plane, jointed, stipitate, standard-shaped minute bodies, separating at the articulations.

SPECIFIC CHARACTER.

ACHNANTHES unipunctata; *articulis perpaucis, quadraticis, margine transversim striatis, puncto colorato notatis.*

A. joints very few, square, transversely striated at the margin, marked with a coloured spot.

ACHNANTHES unipunctata, *Carm.* MSS.
DIATOMA unipunctatum, *Ag. Syst. Alg.* p. 6.
FRAGILLARIA unipunctata, *Lyngb. Hyd. Dan.* p. 183. t. 62.

HAB. Sea-shores, parasitic on various filiform Algæ. Appin, Captain CARMICHAEL.

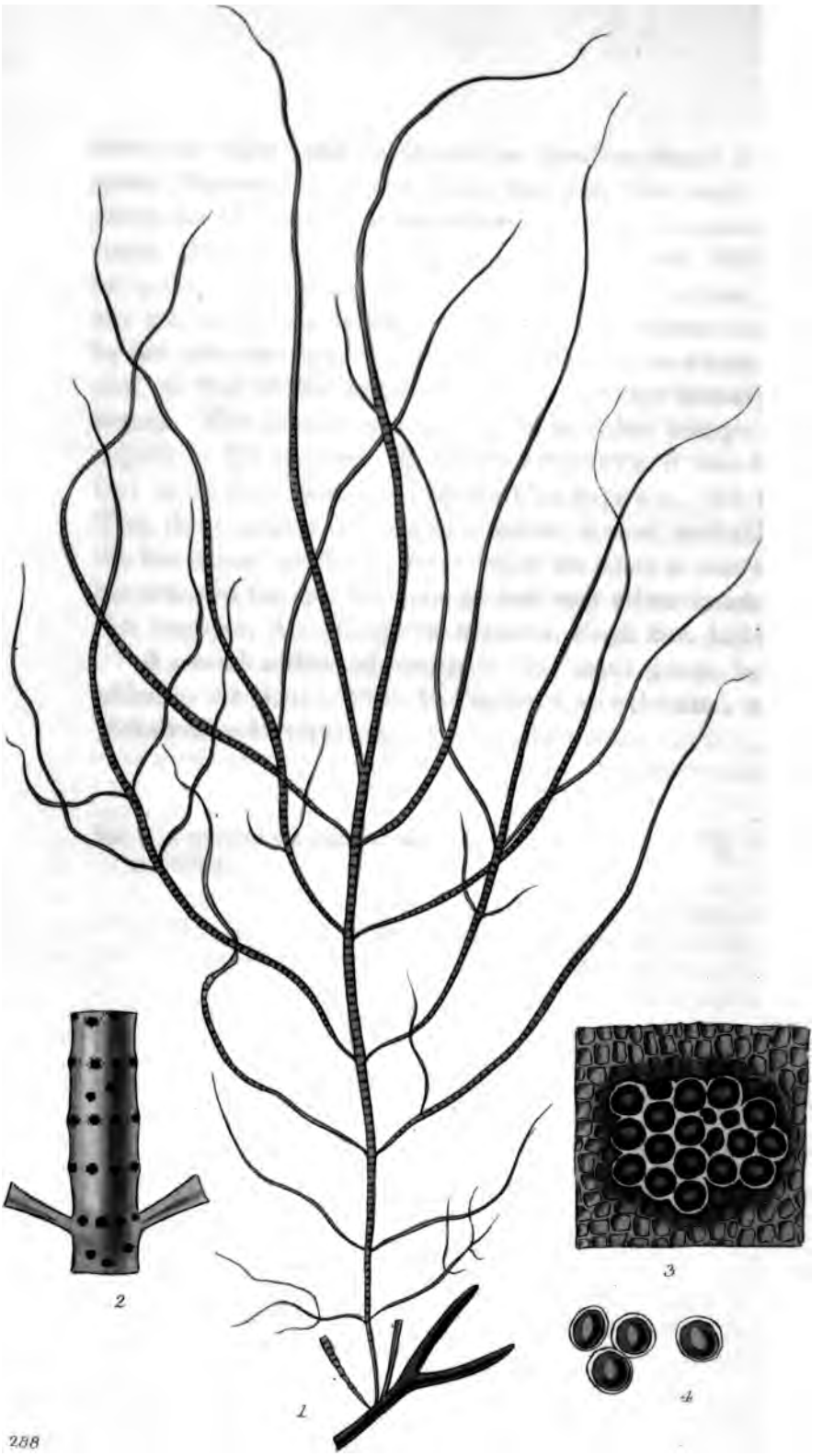
Plant copiously diffused among the various capillary Algæ, and investing their stems and branches; to the naked eye appearing nothing more than a minute green covering or pubescence. *Filaments,* if such they can be called, rectilinear, so much compressed as almost to be plane, with very thin margins, the whole composed of 4–6 joints, the lowest of which is furnished with a stipes at one of its angles; *joints* equal in length and breadth, transversely striated, the striæ dense, reaching about half-way from the margin on each side, towards the centre, which is occupied by a circular spot of a rose or orange colour. The joints are articulated to each other by the alternate angles, but fall asunder with such facility, that it is difficult to obtain a view of them *in situ.* When floating about in profusion after their separation, Captain CARMICHAEL observes that they become grouped together in a singular manner by a sort of corpuscular attraction.

For a knowledge of the exact structure of this curious little Alga, and of its existence on our shores, we are indebted to Captain CARMICHAEL. AGARDH and LYNGBYE did not

detect the stipes; and the former has therefore placed it in the genus *Diatoma*. It is very rarely, however, that such fragile plants can be observed in perfection. Captain CARMICHAEL states, that among innumerable specimens which fell under his notice, it was but once that he had the good fortune to find any attached to the stipes, and only in that instance cohering by the alternate angles. The common state in which it occurs, is that of the curiously combined groups already mentioned. The central spot appears to be either orange or rose colour; in the specimens figured by LYNGBYE, it was the latter; in all those found by Captain CARMICHAEL, the former. That this character is liable to variation, is most probable; for the last-named gentleman mentions, in his letter to me, that he has observed the spot both orange and rose colour in *Achnanthes longipes*, AG. (*Conferva stipitata*, Engl. Bot. t. 2488.)

A second additional species of this small genus has been added to the British Flora by Captain CARMICHAEL, namely, *Achnanthes brevipes*, AG.

Fig. 1. ***A. unipunctata, parasitic on another alga,*** natural size. **Fig. 2.** ***Plants,*** **magnified.**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CARMICHAELIA ATTENUATA.

Slender Carmichaelia.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Frons tubulosa, continua, membranacea, reticulata. Fructus; capsulæ (an granula capsuliformia?) in soris suborbicularibus coacervatæ; sori lineas transversas formantes.

Frond tubular, continuous, membranaceous, reticulated. Fructification; capsules (capsule-like granules?) collected into roundish sori; sori forming transverse lines.

SPECIFIC CHARACTER.

CARMICHAELIA attenuata;.....

SCYTOSIPHON olivascens, *Carm.* MSS.

HAB. Sea-shores, parasitic on various Algæ. Autumn. Appin, Captain CARMICHAEL.

Plant one to two feet in length, branched, above a line in diameter, attenuated at the base, membranaceous, tubular, continuous, of a reticulated structure, and olivaceous colour, assuming a greenish hue when dry; *branches* numerous, long, opposite, greatly attenuated at their base, but still more so at their extremity, sometimes bearing a few opposite slender ramuli. *Fructification* consisting of roundish groups, or sori, arranged in transverse lines about one-sixteenth of an inch apart, and visible to the naked eye; each group is composed of a number of subglobose capsules (or granules) of a dark colour, individually surrounded by a pellucid line, and apparently external, or imbedded in the outer surface of the frond. When the capsules are removed, they still retain a pellucid border, and seem to be enclosed in a delicate membrane. In drying, the frond adheres firmly to paper.

The unwearied exertions which my friend Captain CARMICHAEL has made to explore the marine botany of the coast of Appin, have at length afforded me the gratification of conferring his name upon a plant which I consider equally new as a genus and as an individual. The generic name of *Scytosiphon*, under which that gentleman kindly communicated it, was ori-

ginally established by AGARDH, and is still maintained by that botanist for the *Fucus Filum* of LINNÆUS, and *F. subtilis* of TURNER. LYNGBYE, however, admitted many plants into this genus, which have so little natural affinity, that they even belong to different divisions. He has great merit, and has contributed in no trifling degree to improve our knowledge of marine vegetation; but in the case before us, we prefer on all accounts the authority of Professor AGARDH, who has devoted himself for so many years to the arrangement of the *Algæ*.

In general habit, *Carmichaelia* is not unlike some states of *Solenia compressa* and *clathrata;* particularly when dried. But here the resemblance ends; and for its true situation we must look among the *Fucoideæ*. *Encœlium* there appears to be its nearest ally, but differs in the peculiarity of the fructification. AGARDH has remarked, that *Encœlium* is nearly related to *Zonaria*. The same may be observed of our present plant, whose sori being arranged in transverse lines, render the affinity stronger and very striking. At the same time, the fibrous structure of *Zonaria* is wanting, as well as the plane frond.

Fig 1. *C. attenuata,* natural size. Fig. 2. *A portion of the frond, shewing the transverse lines of sori.* Fig. 3. *A group of capsules.* Fig. 4. *Capsules or granules removed;* magnified.

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EXILARIA FLABELLATA.

Fan-shaped Exilaria.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss. Ag.*

GENERIC CHARACTER.

Corpuscula hyalina, rigida, sublinearia, modo flabelliformi disposita, basi vel sessilia vel ad receptaculum simplex aut ramosum affixa; demum secedentia.

Hyaline, rigid, sublinear corpuscula, arranged in a flabelliform manner, sessile at their base, or fixed to a simple or branched receptacle, at length deciduous.

SPECIFIC CHARACTER.

EXILARIA flabellata; *ramosa, elongata, ramis hyalinis alternis patentibus.*

E. branched, elongated, the branches hyaline, alternate, spreading.

ECHINELLA flabellata, *Carm.* MSS.

HAB. On *Zostera marina*, and several small Algæ, in spring. Appin, Captain CARMICHAEL.

Plants investing the leaves of the *Zostera* for several inches together, of a green colour, and when dry shining with a metallic lustre. *Stem* erect, one-third of an inch in length or more, branched, flexuose, slender, pellucid, colourless. *Branches* spreading, alternate, dilated at the extremities. Every branch is terminated with a fan-shaped expansion, formed of a number of linear, wedge-shaped, hyaline, rigid, yellow bodies. The secondary branches end in smaller expansions, and still smaller ones composed of 1–5 bodies, spring from the sides of the stem and branches. The bodies above described are either wholly of a yellow colour, or partly coloured and partly pellucid; and often when coloured marked at equal distances with two rows of oblong spots. They are very deciduous, separating with the greatest facility from one another, and from their attachment at the base.

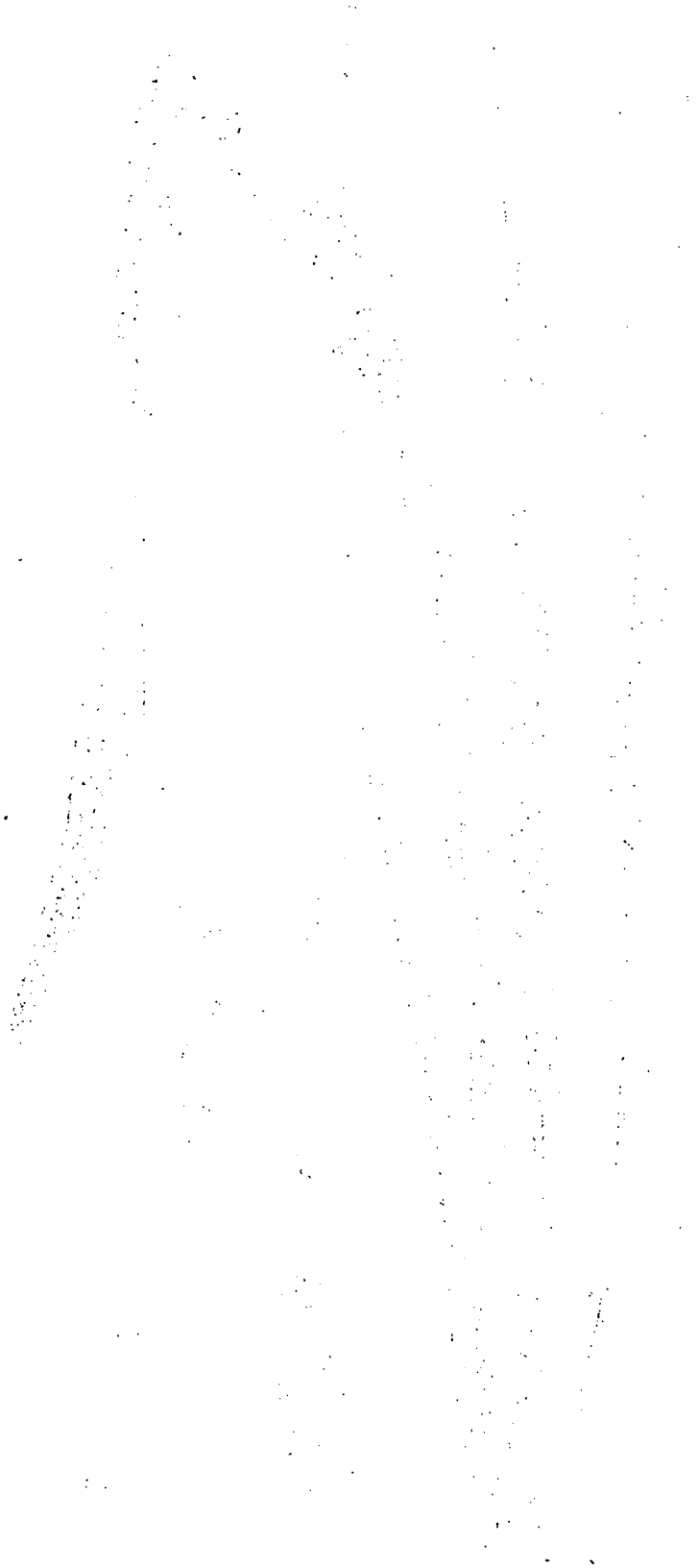
This superb species, discovered by Captain CARMICHAEL on the west coast of Scotland, is undoubtedly the glory of its genus, and in every point of view a beautiful object.

For a long time I have been uncertain about the generic relations of *Diatoma fasciculatum*, AG. and *D. crystallinum*, AG. (*Echinella fasciculatum*, LYNGB.) I was willing with

AGARDH to restrict the genus *Echinella* to that species for which it was originally intended; and at the same time could scarcely see any propriety in placing the two plants I have mentioned in the genus *Diatoma*, as AGARDH has done; notwithstanding the appearance represented by him in Svensk Botanik, t. 491. It is very true, as AGARDH observes to me in a letter, that though all the other *Diatomata* are at first rectilinear, they afterwards separate, some of them grotesquely enough. But in the case of his *D. fasciculatum* and *D. crystallinum*, we must suppose the rectilinear filaments to be attached by one of their edges, and after separating into portions to be still fixed by the same attachment, which is contrary to all we know of the true *Diatomata*. I am inclined to think that the discoveries of Captain CARMICHAEL have thrown much light upon these plants, and will support me in removing the two above named doubtful *Diatomata* into the genus I have proposed to call *Exilaria*. Besides the beautiful species now figured, Captain CARMICHAEL has discovered another, upon which he has bestowed the appropriate name of *fulgens*; and it is singular that both are furnished with a receptacle for the attachment of the linear corpuscula, which proves them to be very distinct from *Diatoma*. To this place will also belong the *Echinella circularis* of this work.

Exilaria fulgens will be published in the next number.

Fig. 1. *E. flabellata, on Zostera marina*, natural size. Fig. 2. *Plants*, magnified.



290

ENCOELIUM LYNGBYANUM.

Elongated Encœlium.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Frons tubulosa, membranacea, reticulata. Fructus; apiculi clavati, massa sporacea nigra repleti.

Frond tubular, membranaceous, reticulated. Fructification; club-shaped processes filled with a dark sporular mass.

SPECIFIC CHARACTER.

ENCŒLIUM Lyngbyanum; *fronde elongata, utrinque attenuata.*

E. frond elongated, attenuated at both extremities.

SCYTOSIPHON fistulosum, *Ag. Disp.* p. 24.

SCYTOSIPHON fistulosus, *Lyngb. Hyd. Dan.* p. 66.—*Carm.* MSS.

SCYTOSIPHON Filum, var. *fistulosus, Ag. Sp. Alg.* v. 1. p. 163.—*Syst. Alg.* p. 258.

CHORDARIA Filum, var. *fistulosa, Ag. Syn.* p. 14.

ULVA fistulosa, *Huds. Fl. Angl.* p. 569.—*Woodw. in Linn. Trans.* v. 3. p. 52. *Sm. Engl. Bot.* t. 642.—*With. Bot. Arr.* v. 4. p. 153.

CONFERVA Fistula, *Roth. Cat. Bot.* v. 3. p. 169.

ULVA lumbricalis, *Lam.*
ULVA simplicissima, *Clem.* } *fide Agardh.*

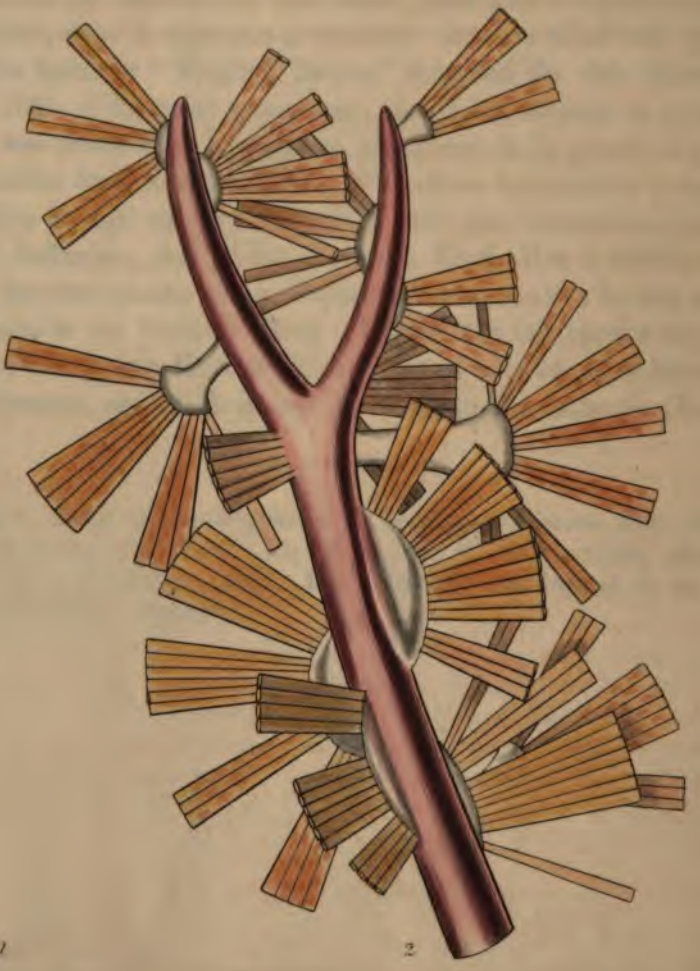
HAB. Sea-shores, fructifying in autumn. Appin, Captain CARMICHAEL. Frith of Forth.

Root minute, scutate. *Fronds* several, growing from the same base, 6 inches to 18 inches in length, tubular, somewhat inflated, attenuated at both extremities, in the centre 2 to 4 lines in diameter, occasionally contracted here and there. *Colour* olivaceous. *Substance* between membranaceous and coriaceous; somewhat tenacious, and gelatinous to the touch; under the microcoscope it appears to be of a reticulated structure. *Fructification* composed of numerous groups of minute club-shaped apiculi, containing a blackish sporular mass. To the naked eye, the groups of apiculi appear like so many dark dots.

It is strange, observes Captain CARMICHAEL, that the fructification of this very common plant should have escaped detec-

tion so long. Common as it is, I believe he is the only individual who has been so fortunate as to gather it in its complete state; and the specimens he has been good enough to send me, suffice to set at rest the long disputed nature of the species. LYNGBYE, to whom the fructification was unknown, as well as to AGARDH, was right, it seems, in persisting to keep it apart from *Scytosyphon Filum*. I have therefore commemorated his acumen in my specific name; for now that the plant has proved an *Encœlium*, the name *fistulosus* is highly inappropriate, since it expresses a character common to all the species. The figure in "English Botany" intended for this plant, has so little of its usual appearance, that I am induced to conclude it was drawn from a specimen influenced in its growth by some peculiar local circumstances. *Encœlium* has another representative in this country, though of very rare occurrence; this is *E. bulbosum*, AG. (*Ulva Turneri*, Engl. Bot. t. 2570.); and as few rare plants escape Captain CARMICHAEL, he has added it also to our Scottish Flora. Besides the two species we have mentioned, only three others are known to exist, *E. echinatum*, *sinuosum*, and *clathratum*; all found in the Atlantic Ocean.

Fig. 1. *Fertile and sterile plants of E. Lyngbyanum*, natural size. Fig. 2. *A portion of a frond.* Fig. 3. *A group of the fructifying processes.* Fig. 4. *Processes or apiculi.* Fig. 5. *Sporular mass removed, in the form of granules;* magnified.



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EXILARIA FULGENS.

Splendid Exilaria.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Corpuscula hyalina, rigida, sublinearia, modo flabelliformi disposita, basi vel sessilia vel ad receptaculum simplex aut ramosum affixa, demum secedentia.

Hyaline, rigid, sublinear, corpuscular, arranged in a flabelliform manner, sessile at their base, or fixed to a simple or branched receptacle, at length deciduous.

SPECIFIC CHARACTER.

EXILARIA fulgens; *corpuscula nitentia, aurantiaca, sublinearia, modo plano, radiante disposita, receptaculo lato, pellucido, simplici, insidentia.*

E. corpuscula shining, orange-colour, sublinear, disposed in a radiating plane manner, seated on a simple, pellucid, broad receptacle.

ECHINELLA fulgens, *Carm.* MSS.

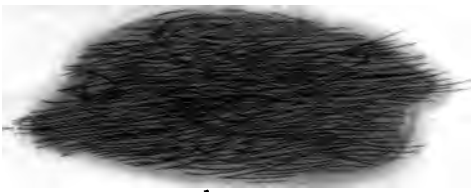
HAB. On various small algæ in the sea, in spring and summer. Appin, Captain CARMICHAEL.

Plant investing the stems of small algæ, of an orange colour when recent; when dry, colourless; shining with a glassy lustre. *Corpuscula* nearly linear, half a line in length, slightly widening upwards, rigid, pellucid, placed side by side in a plane radiating or flabelliform manner, easily separating laterally from each other, but, though divided into several parcels, adhering by the base to the receptacle. *Receptacle* pellucid, mostly hemispherical, but sometimes so elongated as to equal in length the corpuscula it supports.

This beautiful plant I alluded to in the preceding number of this work. The most striking feature in it, is the receptacle, which is simple, and liable to vary in form; but otherwise bears the same relation to the slender corpuscula, as the branched stipes does in *Exilaria flabellata*. The plant is conspicuous for its shining, glistening appearance, resembling in the strongest manner minute portions of spun glass. In this character it is nearly allied to *Exilaria crystallina* (*Diatoma*

crystallinum, AG. and *Echinella fasciculata*, LYNGB.) The plant formerly figured in this work, under the name of *Echinella fasciculata*, is the true *Diatoma fasciculatum* of AGARDH, and will now bear the name of *Exilaria fasciculata*.

Fig. 1. *E. fulgens*, natural size. Fig. 2. *A group of plants*, magnified.



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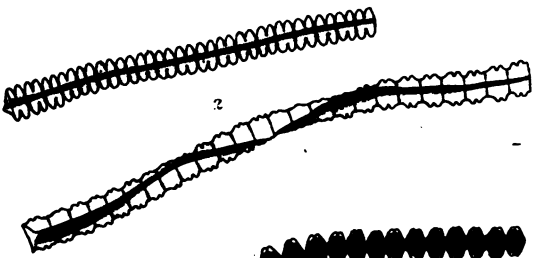

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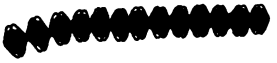

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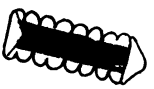

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DESMIDIUM Swartzii.

Triangular Desmidium.

Class and Order CRYPTOGAMIA ALGÆ, *Linn.*—Nat. Ord. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila simplicia, articulata, angulata, angulis hyalinis crenatis, articulis demum secedentibus.

Filaments simple, jointed, angular, the angles hyaline, crenate; joints at length separating.

SPECIFIC CHARACTER.

Desmidium Swartzii; *filis triangularibus, articulis bicrenatis.*

D. filaments triangular, the joints bicrenate.

Desmidium Swartzii, *Ag. Syst. Alg.* p. 9.

Diatoma Swartzii, *Ag. Syn.* p. 34.—*Svensk. Bot.* t. 491. f. 1,–3.—*Lyngb. Hyd. Dan.* p. 177. t. 61.

Hab. In fresh-water, at the bottom of shallow pools and ditches, in spring and the beginning of summer. Appin, Captain Carmichael.

Plant forming a fine green, thin gelatinous fleece. *Filaments* simple, about the thickness of the human hair, equal, flexible, an inch or more in length, triangular, more or less twisted, the angles pellucid and colourless, while the centre is green. *Joints* mostly half as broad as they are long, bicrenate at each of the three angles, separating from each other with facility. Before separation, the two crenatures of each joint appear to contract, and the articulation to be dissolved from the circumference to nearly the centre, so that the filament has for some time a pinnatifid character.

A most curious alga, and hitherto very imperfectly understood. Both Agardh and Lyngbye describe the filaments as plane; and indeed, till the genus *Desmidium* was established by the former, the plant was referred to *Diatoma*. Captain Carmichael, however, in one of his letters to me, observes, that the filaments are triangular; and he is strictly correct. Thus, the apparent anomaly ceases which so much surprized Lyngbye—that the joints, when detached, presented

a triangular figure. That the true form of the filaments is triangular, a careful microscopical examination will convince any one. The filaments are generally more or less twisted, and sometimes occur nearly pellucid and colourless: in such instances, a solitary green line extends in a waving manner along the filament. This line, upon examination, is found to be one of the crenated angles, which being viewed through the body of the filament, is rendered opake. The detachment of the joints is exceedingly curious; and I cannot exactly comprehend in what manner it takes place, unless the internal structure of the filament be more tenacious than the outer membrane. Before the ultimate separation takes place at the articulation of each joint, the outer membrane loses its continuity, and towards the angles appears to collapse. In this state, the filament may be said to be pinnatifid, for the joints are attached only in the centre, as I conjecture by their internal substance. AGARDH has introduced this remarkable appearance into the generic character; but I have been obliged to omit it, as I have not observed it in the new species represented in the subsequent plate.

Fig. 1. *D. Swartzii*, natural size. Figs. 2, 2. *Filaments presenting different appearances.* Fig. 3. *Detached joints;* magnified.

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DESMIDIUM CYLINDRICUM.

Cylindrical Desmidium.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila simplicia, articulata, angulata, angulis hyalinis, crenatis, articulis demum secedentibus.

Filaments simple, jointed, angular, the angles hyaline, crenate; joints at length separating.

SPECIFIC CHARACTER.

DESMIDIUM cylindricum; *filis cylindricis, biangulatis, angulis bicrenatis.*

D. filaments cylindrical, two-angled, angles 2-crenate.

CONFERVA dissiliens, *Sm. Engl. Bot.* t. 2464.?

HAB. At the bottom of shallow pools and ditches of fresh-water in spring. Appin, Captain CARMICHAEL.

Plant forming a thin, fine green gelatinous fleece, like the preceding species. *Filaments* an inch or more in length, about the thickness of a fine hair, flexible, often varying in diameter in the same filament, green, nearly cylindrical, with two slightly prominent, colourless, pellucid angles, opposite to each other. *Joints* not so long as broad, bicrenate at each of the two angles, separating readily at the articulations.

There can be no doubt that this is a true species of *Desmidium*, and I am inclined to think with Captain CARMICHAEL, that it, and not *D. Swartzii*, has probably been described by some authors as *Conferva dissiliens*. The filaments of this species are so nearly cylindrical, as to authorise the use of the term, in opposition to triangular. They are also more unequal than in *D. Swartzii*, and do not present the singular pinnatifid appearance which that species exhibits at a certain stage of its growth.

Fig. 1. *D. cylindricum*, natural size. Fig. 2. *Filaments in different states.* Fig. 3. *Detached joints;* magnified.

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BERKELEYA FRAGILIS.

Fragile Berkeleya.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila simplicia, gelatinosa, granulis oblongis includentia, basi in massa subrotunda, gelatinosa immersa, apice libera.

Filaments simple, gelatinous, containing oblong granules, immersed at the base in a roundish gelatinous mass, the extremities free.

SPECIFIC CHARACTER.

BERKELEYA fragilis; .....

GLOIONEMA fragilis, *Carm.* MSS.

HAB. Parasitic on *Zostera marina;* also on *Furcellaria fastigiata,* and other small algæ; spring. Appin, Captain CARMICHAEL.

Plant of a reddish-brown colour, and roundish or oval form, consisting of a rather firm *gelatinous mass* or *receptacle,* less than half an inch in diameter, and a number of filaments which seem to spring from its surface. This gelatinous receptacle is firmly attached to the plant on which it grows, sometimes surrounding the small branches of *Furcellaria fastigiata.* The *filaments* are immersed for half their length in the receptacle, their extremities being free. They are gelatinous, exceedingly tender and fragile, simple, attenuated towards the apex, apparently destitute of external membrane, and containing a number of oblong or rather fusiform granules, arranged longitudinally, but without order.

The highly curious alga which forms the subject of the present description, is certainly nearly allied to *Monema;* and though the filaments seem to want an external membrane, yet the escape of the granules at the extremity, when a filament is divided, seems to favour the idea that a membrane really exists; the granules are besides arranged without order. With the tenacious gelatinous filaments of *Gloionema,* containing a single series of granules, our plant cannot accord; still less does it agree with the fasciculated filaments of *Schizonema* or *Hydrurus,*

with their regular series of granules. To *Mesocarpus* we must therefore return; but here we find the whole habit of the plant in question so very remote, and the gelatinous receptacle so unlike to any thing observed in the plants most nearly related to it, that I find it absolutely necessary to establish it as the type of a new genus, of which the gelatinous mass imbedding the filaments is the peculiar characteristic. I am desirous that the generic name should express my esteem for the talents of my friend the Rev. M. J. BERKELEY, who has paid much attention to this beautiful tribe of plants.

From the nature of the granules, Professor AGARDH has placed his genus *Schizonema* among the *Diatomeæ*. The granules, he observes, resemble the corpuscula found in the genera *Meridion* and *Frustulia*. *Berkeleya* seems also to partake in this affinity, and in its gelatinous receptacle to approach that of *Meridion vernale* (*Echinella olivacea*, LYNGB.) On the other hand, it is more nearly related to the *Nostochinæ*, where its proper place is next to *Hydrurus*.

Fig. 1. *B. fragilis on Furcellaria fastigiata*, natural size. Fig. 2. *A single plant.* Fig. 3. *Filaments removed.* Fig. 4. *Granules;* magnified.

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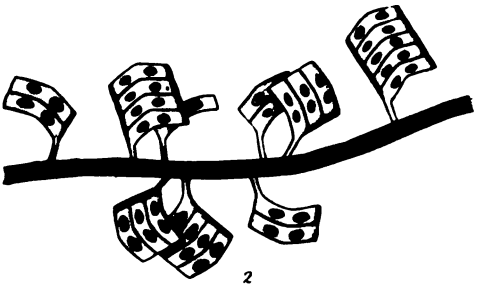

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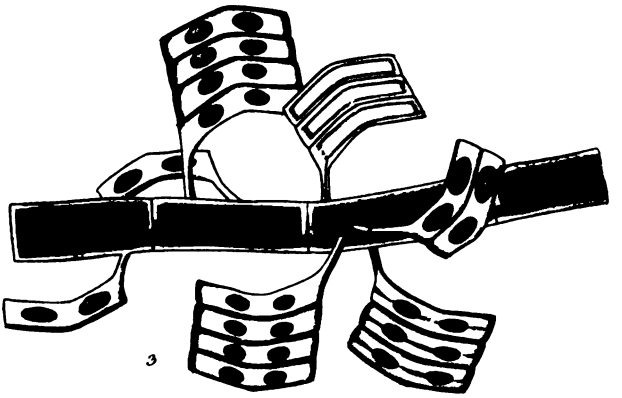

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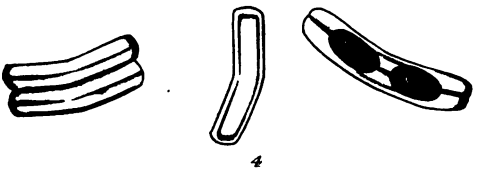

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ACHNANTHES BREVIPES.

Short-stemmed Achnanthes.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Corpuscula plana, articulata, stipitata, vexilliformia, articulis secedentibus.

Plane, jointed, stipitate, standard-shaped, minute bodies, separating at the articulations.

SPECIFIC CHARACTER.

ACHNANTHES brevipes; *articulis bipunctatis, stipite brevissimo.*

A. joints bipunctate, the stipes very short.

ACHNANTHES brevipes, *Ag. Syst. Alg.* p. 1.

ACHNANTHES adnata, *Bory, Dict. Class. d'Hist. Nat.* v. 1. p. 79. fig. 2. *(Arthrodiées.)*

ECHINELLA stipitata, *Lyngb. Hyd. Dan.* t. 70.—*Jurg. Alg. Exsicc.* No. 13.

HAB. On small algæ in the sea. Appin, Captain CARMICHAEL.

Plant very minute, parasitic on various species of small algæ, composed of four or five joints, the lowermost one furnished with a stipes, scarcely longer, in general, than the smaller diameter of one of the joints. *Joints* curved, or forming a very obtuse angle in the centre, so short that each may be said to be transversely linear, four of them forming nearly a square: they are pellucid, and marked with two oval or oblong orange spots; they separate readily at the articulations, and therefore individuals are frequently observed with three, two, or even a single joint only remaining, attached by its stipes.

This little alga, so whimsical in its appearance, is more nearly allied to *Achnanthes longipes*, represented in "English Botany," under the name of *Conferva stipitata*, than to *Achnanthes unipunctata*, figured in my last number. It is well marked by its short stipes, and the two spots in each articulation, as also by the absence of the dense striæ which characterise *A. longipes*.

Like *A. unipunctatus*, the present species was discovered for the first time on the British coast by Captain CARMICHAEL.

Fig. 1. *A. brevipes*, natural size. Fig. 2. *A group of plants.* Fig. 3. *Another group.* Fig. 4. *Detached joints;* magnified.

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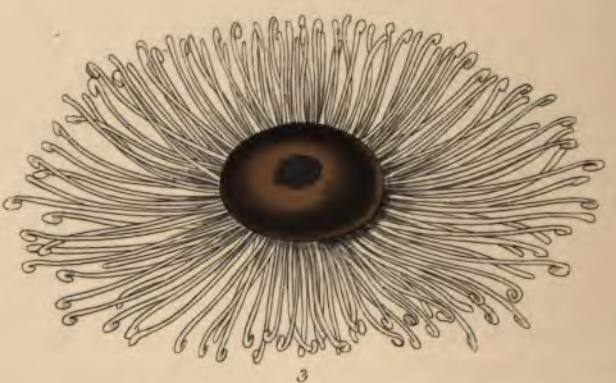
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ERYSIPHE ADUNCA.

Hooked Erysiphe.

CLASS AND ORDER CRYPTOGAMIA FUNGI, *Linn.*—*GASTEROMYCETES*, ORD. IV. SCLEROTIACEI, *Fries.*

GENERIC CHARACTER.

Peridium globosum, carnosum, floccis decumbentibus impositum, sporangiolis solitariis vel pluribus refertum.

Peridium globose, carnose, seated on decumbent flocci, and containing one or many sporangiola.

SPECIFIC CHARACTER.

ERYSIPHE adunca; *floccis matricalibus effusis, albis, radicantibus simplicibus, rectis, longitudine æqualis, apice arcte aduncis, demum incurvis elevatis.*

E. primary flocci effused, white, the radical ones simple, straight, equal in length, closely hooked at the apex, at length incurved and elevated.

ERYSIPHE adunca, *Link, in Willd. Sp. Pl.* v. 6. Pt. 1. p. 111.
ERYSIPHE Populi, *De Cand. Fl. Franç.* v. 6. p. 104.
ERYSIPHE Prunastri, *De Cand.* l. c. p. 108.
ERYSIPHE clandestina, *Bernard, St. Sicil.* 3. p. 20. t. 4. f. 4. *fide Link.*
ALPHITOMORPHA adunca, *Wallr. in Verh. Nat. Freund.* 1. p. 37.

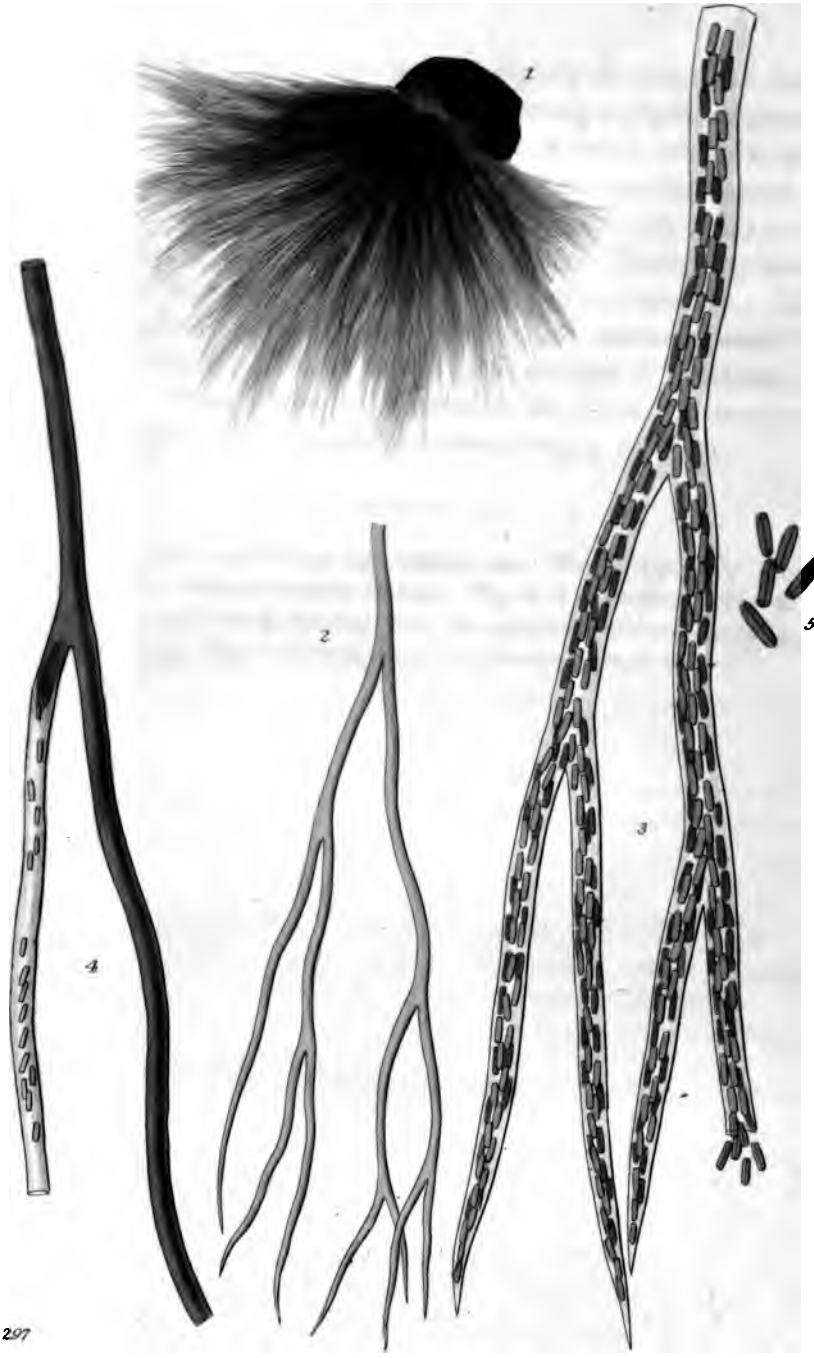
HAB. On both surfaces of the leaves of various species of Poplar, Willow, Elm, and other trees and shrubs, not unfrequent.—It has also been recently communicated to me from Oxford by Mr BAXTER.

First appearance of the *plant*, a delicate, effused, white web, composed of very fine, short, densely entangled filaments. In the midst of these, the *peridia* are produced, in a scattered or aggregate manner, of a minutely globular form, pale at first, but when mature, of a nearly black colour. Attached to the base of each are numerous, radicular, straight, simple, white diverging filaments, equal in length, and closely hooked or doubled back underneath at the apex. When the plant is mature, the radicular filaments are curved upwards, rising above the peridium. *Sporangiola* several, oval, containing three or four *sporidia*.

The most beautiful of the genus. Under a pocket magnifier, the peridia, with their radicular filaments, resemble little

sparkling stars. The filaments are slightly thickened at their extremity, and singularly recurved, shewing a slight approach to the genus *Podosphæria* of Professor KUNZE, which is perhaps too nearly related to *Erysiphe*. The peridia appear to vary somewhat in size on different plants, and still more so in the number of radicular radiating filaments. Excepting these particulars, however, I perceive no variation in character. The finest specimens I have seen, were those communicated by Mr BAXTER, particularly in the great number of radiating filaments. These I have represented in the Plate. Sometimes the filaments do not exceed in number twenty or thirty.

Fig. 1. *E. adunca on a Willow leaf,* natural size. Fig. 2. *A group of plants, two of them with the filaments elevated.* Fig. 3. *A single plant.* Fig. 4. *A peridium in the act of bursting from the application of moisture.* Fig. 5. *Sporangiola.* Fig. 6. *Extremities of two filaments;* magnified.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MONEMA Dillwynii.

Dillwyn's Monema.

Class and Order CRYPTOGAMIA ALGÆ, *Linn.*—Nat. Ord. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila libera, continua, tubulata, capillaria, granula oblonga vel subelliptica includentia.

Filaments free, continuous, tubular, capillary, containing oblong or subelliptical granules.

SPECIFIC CHARACTER.

Monema Dillwynii; *filis olivaceis, dichotome ramosis apice attenuatis, acutis, granulis lineari-oblongis, linea longitudinali notatis, numerosis, sine ordine dispositis.*

M. filaments olivaceous, dichotomously branched, attenuated and acute at the apex; the granules linear-oblong, marked with a longitudinal line, numerous, disposed in no particular order.

Schizonema Dillwynii, *Ag. Syst. Alg.* p. 10.?

Conferva fœtida, *Dillw. Conf.* t. 104.?—*Jurg. Alg.* fasc. 10. No. 8.

Hab. On small stones, and various small Algæ, in the sea. Appin, Captain Carmichael. Frith of Forth.

Plant growing in dense tufts, about two inches in length, of an olive or olive-green colour, and frequently of a fœtid odour. *Filaments* flaccid, more or less branched in a dichotomous manner, slender, attenuated towards the extremity, acute; the external membrane evident, somewhat tenacious, pellucid. *Granules* numerous, linear-oblong, marked from end to end with either a line or furrow: they are of a green colour, and arranged longitudinally within the filaments, but in no regular order. Sometimes, according to Captain Carmichael, the filaments are opaque and fuscous.

I have already alluded to the confusion which exists among the species of this genus. Agardh himself, who has not had the advantage of examining some of them in a recent state, observes, "In hoc genere quid species sit, certe nondum constat. Ideo synonyma pro distinctis separavi distinguere malim quam

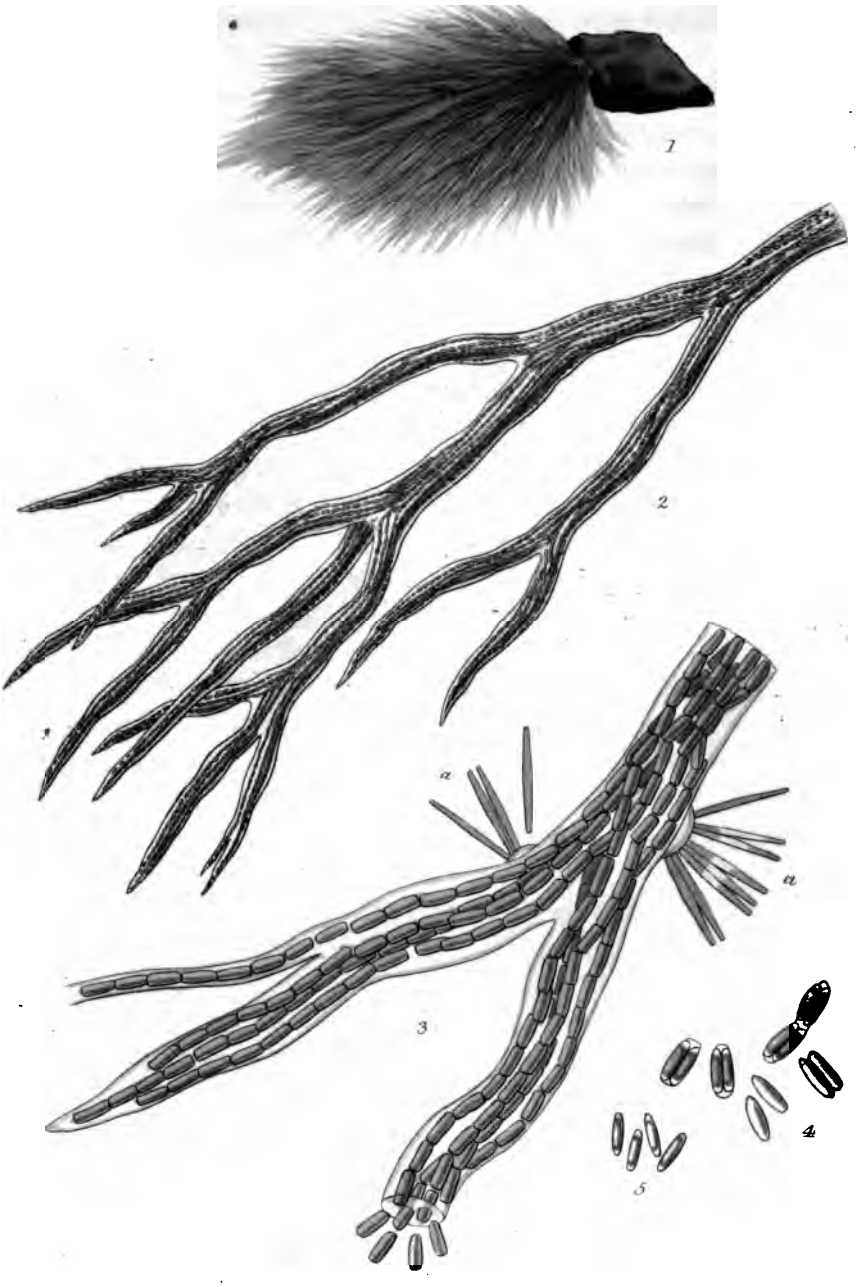
confundere. Si tandem eadem esse inveniatur, transitus facilis a specie ad varietatem ; semel vero confusa, ægre iterum distinguuntur."

It is yet somewhat doubtful what is the plant which DILLWYN has represented under the name of *Conferva fœtida ;* though I am inclined to think the object of the present description is correctly referred to it. In habit the two plants agree. The greatest difference is, in the single series of granules, which is represented in DILLWYN's figure as filling up the whole filament. According to Captain CARMICHAEL, who has favoured me with a drawing of this plant, the filaments sometimes occur of an opake purplish-brown colour. Is it not possible that *Conferva comoides* of DILLWYN and SMITH (*Scytonema comoides*, AG.) may be a state of *Monema Dillwynii ? Conferva comoides* is a very flaccid plant, growing in precisely the same manner, and in the same situation as the other. I have my doubts also whether any true species of *Scytonema* grow in the sea. *Scyt. Sowerbyanum* AG. from its structure should be removed from that genus.

Monema Dillwynii is furnished with an obvious tubular membrane, and is distinctly branched. Like *M. quadripunctatum*, it is of a simple structure, not compounded of other filaments. Such, also, appears to be *Bangia micans* of LYNGBYE, judging from his figure ; and certainly *Monema apiculatum* (*Gloionema apiculatum* of this work).

The specimen of *Conferva fœtida* given by JURGENS in his work, is undoubtedly the same as the plant I have figured, and yet he quotes the *Conferva fœtida* of " English Botany" as *optime !* Of the *C. fœtida* of VAUCHER he is correctly dubious.

Fig. 1. *M. Dillwynii*, natural size. Fig. 2. *Portion of a filament.* Fig. 3. *Ditto.* Fig. 4. *Portion of a filament, as observed by Captain Carmichael.* Fig 5. *Granules ;* magnified.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SCHIZONEMA SMITHII.

Common Schizonema.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila libera, continua, e filis angustioribus coadunatis composita, granula elliptica includentibus.

Filaments free, continuous, composed of other smaller filaments longitudinally united, and containing elliptical granules.

SPECIFIC CHARACTER.

SCHIZONEMA Smithii; *filis cæspitosis, irregulariter ramosis, acutis, granulis geminatis lineis parallelis confertis.*

S. filaments tufted, irregularly branched, acute; granules geminate, in crowded parallel lines.

SCHIZONEMA Smithii, *Ag. Syst. Alg.* p. 10.
ULVA fœtida, *Smith, Engl. Bot.* t. 2101.

HAB. On stones and various small Algæ in the sea. Appin, Captain CARMICHAEL.

Plant tufted, one to two inches in length or more, of a pale reddish, yellowish, or greenish hue. *Filaments* destitute of an external membrane, and apparently composed of a pellucid gelatinous mass, formed by the union of several smaller filaments, each containing a regular single series of granules. The filaments are branched in a most irregular manner, and vary in thickness, according to the number of lesser filaments of which they are formed. The branches are produced by a certain number of the lesser filaments deviating from the main stem; towards the extremity they become more frequent, and the main stem is often split into three divisions at the same point. The ultimate divisions are acute, and it not unfrequently happens that a solitary lesser filament is detached from the remainder. *Granules* greenish-yellow, geminate, elliptical, the two individuals ultimately separating; arranged like a necklace in continuous parallel lines, each line denoting the presence of a lesser filament.

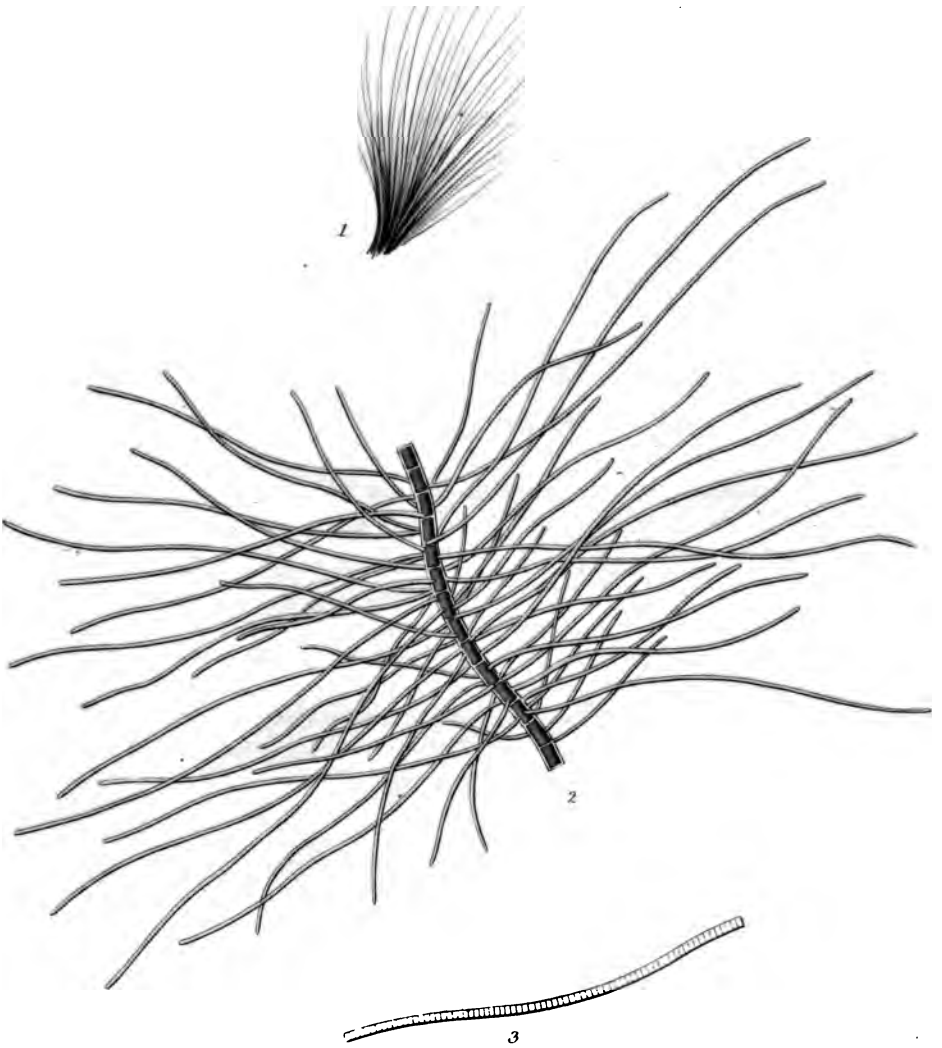
To this plant the generic name of *Schizonema* may be most properly applied; for it is really compounded of several minor filaments, which divide of themselves, and in such a manner as

to imply a structure different from that in the genus I have named *Monema*. *Schizonema lacustre* of AGARDH seems also to be a true species. But respecting *S. Grateloupii, corymbosum* and *ramosissimum*, I have no means of deciding whether they belong to *Monema* or *Schizonema*.

Gloionema has been justly observed by Captain CARMICHAEL to differ from *S. Smithii* in a generic sense, only by its simple form. Perhaps some other character may hereafter be found to distinguish it; for if a plant (of which I have my doubts), it is certainly distinct from *Schizonema*. I do not see, however, how the genus *Hydrurus* can be sustained; for the character, " Frons gelatinosa filis coadunatis hyalinis granula elliptica seriatim continentibus composita," seems to apply strictly to *Schizonema*. *Hydrurus Vaucherii*, AG. probably belongs to *Schizonema;* but my copy of VAUCHER's work is unfortunately not at hand for consultation. *Hydrurus penicillatus*, as far as I can judge from dried specimens, I agree with AGARDH really forms a distinct genus; but its character will require to be modified.

Parasitic upon one of my figures I have represented at *a*, *Exilaria fasciculatum* (*Diatoma fasciculatum*, AG.), which I was so fortunate as to observe fixed to a base similar to that in *Exilaria fulgens*.

Fig. 1. *Schizonema Smithii*, natural size. Fig. 2. *Portion of a frond.* Fig. 3. *Termination of a frond.* Fig. 4. *Geminate granules, viewed in front and profile.* Fig. 5. *Granules after separation;* magnified.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CALOTHRIX LUTEOLA.

Yellowish Calothrix.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Fila muco matricali destituta, affixa, rigidiuscula, tubo continuo, intus annulato.

Filaments destitute of a mucous layer, fixed, somewhat rigid, the tube continuous, annulated within.

SPECIFIC CHARACTER.

CALOTHRIX luteola; *filis hyalinis, luteolis, tenuissimis, elongatis, flexibilis, sparsis.*

C. filaments hyaline, yellowish, exceedingly slender, elongated, flexible, scattered.

HAB. In small rocky pools on the sea-shore, a little below the ordinary flood level; parasitic on *Scytosiphon fœniculaceus, Solenia clathrata, Ectocarpi,* and other filiform Algæ, in the autumn. Appin, Captain CARMICHAEL.

Plant of a pale yellowish colour, investing the stems of filiform Algæ with its numerous filaments, and giving them a most delicate feathery appearance. *Filaments* nearly a line in length, exceedingly fine, transparent, equal, somewhat rigid, but perfectly flexible, fixed by their base, very numerous, but neither fasciculate nor tufted; the annular divisions only visible in the most favourable light, and under the nicest management of the microscope.

A most delicate new species, kindly communicated by my friend Captain CARMICHAEL. There can be no doubt of that naturalist being correct in referring it to the genus *Calothrix;* for though it is impossible to ascertain the structure, on account of its extreme tenuity, the habit is too strong to be mistaken. Captain CARMICHAEL observes that he has found it in the same spot during five successive years.

Calothrix is a genus founded by Professor AGARDH to receive various plants, formerly species of *Confervæ* and *Oscilla-*

toriæ, whose structure consists of a series of annuli enclosed within a tube, at regular intervals. True articulated joints are not found in the tribe *Oscillatorinæ*. From the genera *Oscillatoria* and *Lyngbya* it differs in having the filaments attached at one of their extremities, the other being free.

Fig. 1. *C. luteola, on a small tuft of Ectocarpus,* natural size. Fig. 2. *A portion of a filament of Ectocarpus, with the Calothrix.* Fig. 3. *Portion of a filament of the Calothrix;* magnified.

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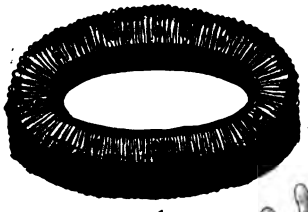

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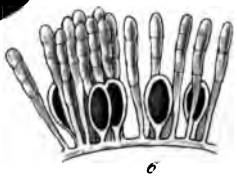


6

MYRIONEMA STRANGULANS.

Dark encircling Myrionema.

CLASS AND ORDER CRYPTOGAMIA ALGÆ, *Linn.*—NAT. ORD. *ALGÆ, Juss.*

GENERIC CHARACTER.

Massa gelatinosa effusa, e filis brevibus, clavatis, erectis, nudis, basi ad laminam tenuem affixis, composita. Fructus; capsulæ ad basin inter fila, brevi-pedicellatæ erectæ.

An effused gelatinous mass, composed of short, club-shaped, erect, naked filaments, fixed at their base to a thin expansion. Fructification; shortly pedicellate erect capsules at the bottom, between the filaments.

SPECIFIC CHARACTER.

MYRIONEMA strangulans; .....

LINKIA strangulans, *Carm.* MSS.

HAB. On the smaller species of *Solenia*; in summer. Appin, Captain CARMICHAEL. Isles of Iona and Staffa, abundant.

Plant parasitic, and surrounding the fronds on which it grows in a most strict embrace, and distorting them more or less, according to the number of plants upon them. Each plant is about a line or a little more in length, and about two-thirds less in diameter (including the frond of the *Solenia*), of a blackish colour, and firm gelatinous consistence. If the plant be transversely divided, *Solenia* and all, and placed under the microscope, it is found to be entirely composed of a multitude of naked, club-shaped, very short, pellucid, yellowish, jointed filaments, standing erect upon a thin membranous expansion, which is immediately attached to the frond of the *Solenia*. *Fructification* ovate olivaceous capsules, surrounded with a pellucid border, very shortly pedicellate, arising from the membranous expansion, and standing erect among the filaments, than which they are nearly two-thirds shorter.

Common as this little plant probably is, I do not believe it was noticed by any one, till Captain CARMICHAEL collected it upon the shores of Appin. Among the Western Islands it is exceedingly abundant, especially at Iona, where it was point-

ed out to me by the above-mentioned gentleman in a hasty excursion performed last summer (1826). In some places it was scarcely possible to gather a specimen of the smaller *Soleniæ* free from the parasite.

From the minuteness of the parts, the fructification is liable to be overlooked, and it was some time before I noticed it; and as Captain CARMICHAEL had bestowed upon it the MS. name of *Linkia strangulans*, it is probable it had escaped his observation from the same cause. As it is, it forms a most remarkable feature, and removes the plant from every genus I am acquainted with. It evidently belongs to the *Nostochinæ* of AGARDH, and appears to claim most affinity with *Coryne-phora marina*, AG.

Fig. 1. *M. strangulans on a Solenia*, natural size. Fig. 2. *A plant surrounding the frond.* Fig. 3. *A younger plant.* Fig. 4. *A transverse slice of the Myrionema and frond.* Fig. 5. *A portion of the Myrionema, with a part of the frond of the Solenia separating at the base.* Fig. 6. *Filaments and capsules;* magnified.

ALPHABETICAL INDEX

TO THE

GENERA, SPECIES AND SYNONYMES

IN

VOLUME FIFTH.

	Plate
ACHNANTHES.	
adnata, Bory,	295
brevipes, Ag.	ib.
unipunctata, Carm.	287
ÆCIDIUM.	
candidum, Gmel.	251
ÆGERITA.	
candida, Pers.	268
setosa, Carm.	ib.
ÆTHALIUM.	
flavum, Link,	272
AGARICUS.	
amethysteus, Bull.	249
amethystinus, Huds.	ib.
carneus, Schæff.	ib.
farinaceus, Huds.	ib.
laccatus, Scop.	ib.
livido-purpuraceus, With.	ib.
rosellus, Batsch.	ib.
rubellus, Schæff.	ib.
subcarneus, Batsch.	ib.
AGARICUS.	
cantharellus, L.	258
chantarellus, Schæff.	ib.
pseudo-Boletus, Jacq.	245
ALPHITOMORPHA.	
adunca, Wallr.	296
ASCOPHORA.	
Mucedo, Tode,	269
AURICULARIA.	
reflexa, Bull.	256
aurantiaca, Schum.	ib.
AURICULARIA.	
caryophyllea, Sow.	264
BANGIA.	
quadripunctata, Lyngb.	286
BERKELEYA.	
fragilis, Grev.	294
BOLETUS.	
auriformis, Bolt.	256
Buglossum, Retz,	270
dimidiatus, Thunb.	245
Hepaticus, Huds.	270
lucidus, Leyss.	245
nitens, Batsch.	ib.
obliquatus, Bull.	ib.
resupinatus, Fl. Dan.	ib.
rugosus, Jacq.	ib.
sanguineus, Plan.	270
variegatus, Schæff.	245
verniceus, Brot.	ib
vernicosus, Bergm.	ib.
BOTRYTIS.	
nigra, Lk.	274
BOTRYTIS.	
terrestre, Fries,	257
BRYUM.	
Tozeri, Grev.	285
BYSSUS.	
aurantiaca, Lam.	260
barbata, Huds.	ib.
botryoides, Lightf.	243
botryoides, Fl. Dan.	282
cryptarum, DC.	259

	Plate
BYSSUS.	
fulva, Huds.	260
mollissima, Ehrh.	259
septica, Huds.	ib.
CÆOMA.	
candidum, Nees,	251
CALOTHRIX.	
luteola, Grev.	299
CAMPYLOPUS.	
lævigatus, Brid. ? ?	284
CANTHARELLUS.	
cibarius, Fries,	258
CARMICHAELIA.	
attenuata, Grev.	288
CEUTHOSPORA.	
Lauri, Grev.	254
phacidioides, Grev.	253
CHLOROCOCCUM.	
vulgare, Grev.	262
CHORDARIA.	
Filum, var. Ag.	290
CONFERVA.	
alpina, Bory,	261
confragosa, Lightf.	ib.
ericetorum, Roth.	ib.
violacea, Huds.	ib.
CONFERVA.	
dissiliens, E. B. ?	293
Fistula, Roth.	290
fœtida, Dillw.	297
CORTICIUM.	
laciniatum, Pers.	264
Sambuci, Pers.	242
CRYPTOSPHÆRIA.	
bifrons, Grev.	253
Lauri, Grev.	254
DEMATIUM.	
antennæforme, Hoffm.	255
strigosum, Pers.	260
DESMIDIUM.	
cylindricum, Grev.	293
Swartzii, Ag.	292
DIATOMA.	
Swartzii, Ag.	292
unipunctatum, Ag.	287
DICRANUM.	
piliferum, Schleich.	284
DIDYMOSPORIUM.	
betulinum, Grev.	273
elevatum, Lk.	ib.
ECHINELLA.	
flabellata, Carm.	289
ECHINELLA.	
geminata, Lyngb.	244
stipitata, Lyngb.	295
ENCŒLIUM.	
Lyngbyanum, Grev.	290
ERINEUM.	
aureum, Schum.	250
fagineum, Pers.	ib.
Juglandinum, Pers.	263
Juglandis, Gærtn.	ib.
lacteum, Fries,	250
populinum, Pers.	ib.
Sorbeum, Pers.	263
Sorbi, Funck,	ib.
subulatum, Grev.	ib.
ERYSIPHE.	
aduncа, Lk.	296
clandestina, Bern.	ib.
Populi, DC.	ib.
Prunastri, DC.	ib.
EXILARIA.	
flabellata, Grev.	289
fulgens, Grev.	291
FIBRILLARIA.	
vinaria, Sow.	259
FISTULINA.	
buglossoides, Bull.	270
Buglossum, Pers.	ib.
hepatica, With.	ib.
FRAGILLARIA.	
unipunctata, Lyngb.	287
FUCUS.	
bicornis, Gmel.	277
phyllitis, var. Clem.	ib.
FULIGO.	
candida, Pers.	272
flava, Pers.	ib.
pallida, Pers.	ib.
rufa, Pers.	ib.
vaporaria, Pers.	ib.
GOMPHONEMA.	
geminatum, Ag.	244
minutissimum, Grev.	ib.
GRIMMIA.	
leucophæa, Grev.	284
HELVELLA.	
acaulis, Huds.	256
æruginosa, Fl. Dan.	241
caryophylla, Bolt.	264
pineti, L.	ib.
versicolor, Liljebl.	256
villosa, Relh.	ib.

	Plate
HYDNUM.	
Radula, Fries,	278
spathulatum, Grev.	278
sublamellosum, Bull.	248
HYPODRYS,	270
HYPNUM.	
alpestre, Sw.	282
molle, Dicks.	283
rupestre, Schleich.	ib.
stramineum β, Schw.	279
trifarium, W. & Mohr,	279
uliginosum, Schleich.	ib.
LAMINARIA.	
debilis, Ag.	277
LEPRA.	
botryoides, DC.	262
LEPRARIA.	
botryoides, Ach.	262
olivacea α, Ach.	ib.
LICEA.	
circumcissa, Pers.	252
strobolina, A. & S.	275
LICHEN.	
botryoides, Ach.	262
LINKIA.	
strangulans, Carm.	300
LYCOGOLA.	
contortum, Ditm.	266
LYCOPERDON.	
lumbricale, Batsch.	ib.
luteum, Jacq.	272
MELANCONIUM.	
betulinum, Kunze,	273
MERULIUS.	
cantharellus, Pers.	258
caryophylleus, With.	264
Merismoides, Eries,	280
MONEMA.	
Dillwynii, Grev.	297
quadripunctatum, Grev.	286
MONILIA.	
antennata, Pers.	255
MUCEDO.	
grisea, Pers.	269
MUCOR.	
ascophorus, Lk.	ib.
Mucedo, Pers.	ib.
ovatus, Schæff.	272
roridus, Willd.	269
septicus, L.	272
spongiosus, Leyss.	267

	Plate
MYRIONEMA.	
strangulans, Grev.	300
NOSTOC.	
botryoides, Ag.	243
OSCILLATORIA.	
rupestris, Grev.	246
OZONIUM.	
auricomum, Lk.	260
fulvum, Pers.	ib.
radians, Pers.	ib.
PALMELLA.	
botryoides, Lyngb.	243
hyalina, Lyngb.	247
protuberans, Grev.	243
PERICHÆNA.	
populina, Fries,	252
strobolina, Fries,	275
PEZIZA.	
æruginosa, Pers.	241
viridissima, Hall.	ib.
PHACIDIUM.	
multivalve, Schmidt,	253
PHLEBIA.	
Merismoides, Fries,	280
PHYLLERIUM.	
Juglandinum, Fries,	263
Sorbeum, Deutschl. Schwaem.	ib.
POLYPORUS.	
lucidus, Fries,	245
PYRENIUM.	
lignatile, Fries,	276
PYRENIUM.	
lignorum α, Tode,	271
RACODIUM.	
cellare, Pers.	259
RADULUM.	
orbiculare, Fries,	288
RETICULARIA.	
alba, Bull.	267
carnosa, Sow.	272
cerea, Sow.	ib.
hortensis, Bull.	ib.
lutea, Bull.	ib.
ovata, var. 1. With.	ib.
ovata, var. 2. With.	267
septica, With.	272
Thlaspi, Relh.	251
RUBIGO.	
faginea, Nees,	250
populina, Mart.	ib.
SCHIZONEMA.	
Smithii, Ag.	298

	Plate
SCHIZONEMA.	
Dillwynii, *Ag.*	297
quadripunctatum, Ag.	286
SCLEROTIUM.	
Ægerita, Hoffm.	268
SCYTOSIPHON.	
Filum, var. Ag.	290
fistulosum, Ag.	ib.
fistulosus, Ag.	ib.
olivascens, Carm.	288
SISTOTREMA.	
confluens, Pers.	248
SPHÆROCARPUS.	
subsessilis, Bull.	252
SPHÆRIA.	
bifrons, Sow.	253
Hederæ β, Fries,	254
Hederæ β, Nees,	253
Lauri, Sow.	254
olivacea, Willd.	271
SPUMARIA.	
alba, DC.	267
Mucilago, Pers.	ib.
STACHYLIDIUM.	
candidum, Grev.	257
terrestre, Lk.	ib.
STERCUM.	
hirsutum, Pers.	256
STILBOSPORA.	
betulinum, Pers.	273
spermatodes, Lk.	ib.
STILBUM.	
tomentosum, Schrad.	281
THELEPHORA.	
calcea γ ? Pers.	242
caryophyllea β, Pers.	264
cretacea, Fries,	242
hirsuta, Willd.	256
laciniata, Pers.	264

	Plate
THELEPHORA.	
mesenteriformis, Fl. Dan.	246
papyracea, Fl. Dan.	256
Sambuci, Pers.	242
TORULA.	
antennata, Pers.	255
TREMELLA.	
botryoides, Schreb.	243
marina, Dill. ?	277
TRICHIA.	
gymnosperma, Pers.	252
reticulata, Pers.	266
TRICHODERMA.	
viride, Pers.	271
TUBIFERA.	
strobolina, Poir.	275
ULVA.	
furfuracea, Fl. Dan.	265
ULVA.	
fistulosa, Huds.	290
fœtida, Sm.	298
lumbricalis, Lam.	290
plantaginia, Roth.	277
plantaginifolia, Wulf.	277
protuberans, Sm.	243
simplicissima, Clem.	290
UREDO.	
candida, Pers.	251
cruciferarum, DC.	ib.
inaperta, DC.	ib.
Petroselini, DC.	ib.
Thlaspi, Sow.	ib.
Tragopogi, DC.	ib.
VIRGARIA.	
nigra, Nees,	274
VORTICELLA.	
pyraria, Müll.	244
XYLOMA.	
multivalve, DC.	253

SYSTEMATIC INDEX

TO

VOLUME FIFTH.

Order EPIPHYTÆ.

	Plate
Didymosporium betulinum, -	273

Order BYSSOIDEÆ.

	Plate		Plate
Stachylidium terrestre, *Link*, -	257	Racodium cellare, *Pers.* -	259
Botrytis nigra, *Link*, - -	274	Ozonium auricomum, *Link*, -	260
Monilia antennata, *Pers.* -	255		

Order GASTROMYCI.

Erineum fagineum, *Pers.* -	250	Perichæna populina, *Fries*, -	252
——— populinum, *Pers.* -	ib.	——— strobolina, *Fries*, -	275
——— Juglandis, *Gærtn.* -	263	Æthalium flavum, *Link*, -	272
——— Sorbi, *Funck*, -	ib.	Spumaria Mucilago, *Pers.* -	267
Uredo candida, *Pers.* - -	251	Stilbum tomentosum, *Schrad.*	281
Ascophora Mucedo, *Tode*, -	269	Pyrenium lignatile, *Fries*, -	276
Trichoderma viride, *Pers.* -	271	Ægerita candida, *Pers.* -	268
Trichia reticulata, *Pers.* -	266	——— setosa, *Carm.* -	ib.
		Erysiphe adunca, *Link*, -	296

Order FUNGI.

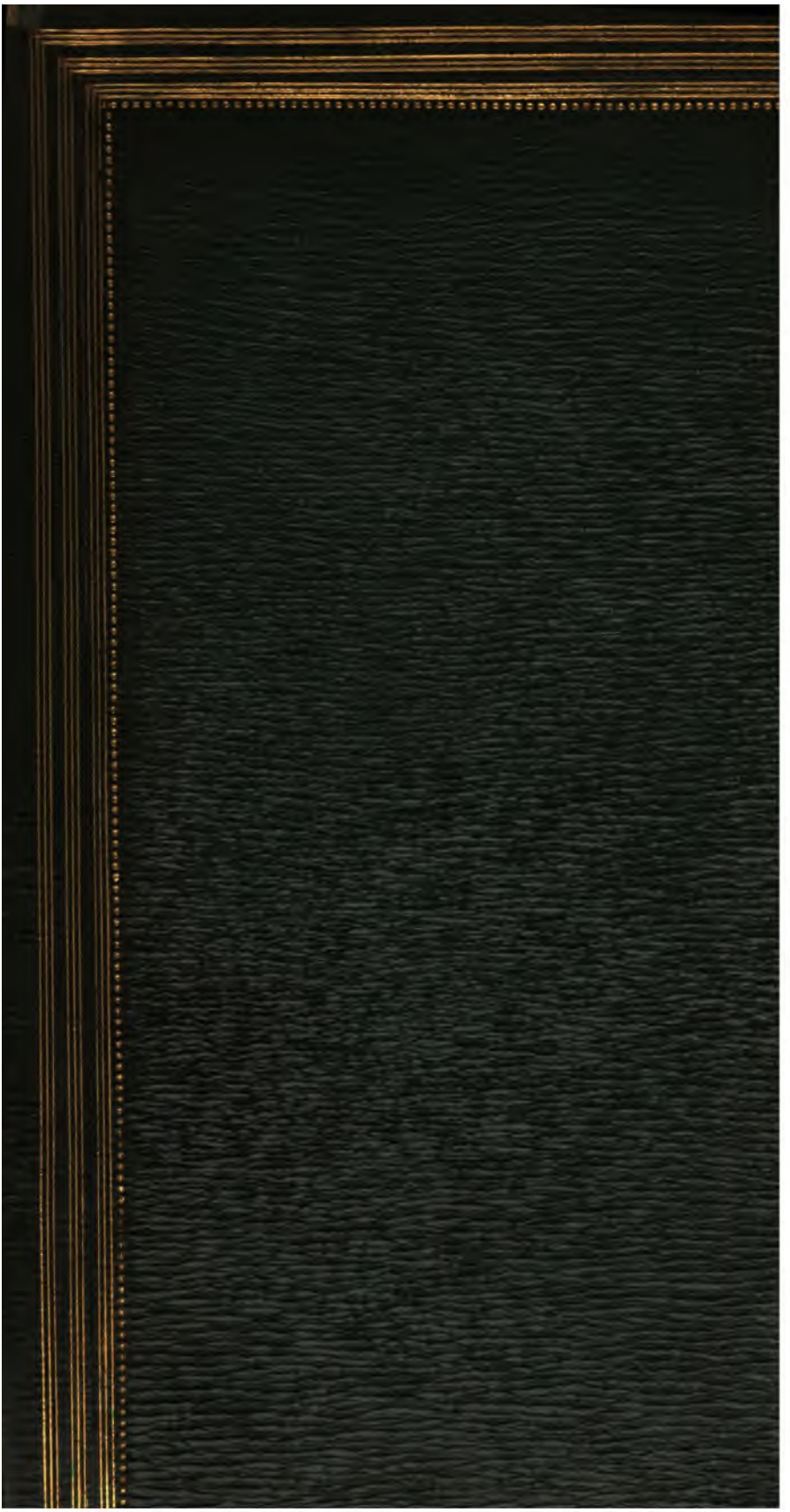
Agaricus laccatus, *Scop.* -	249	Radulum orbiculare, *Fries*, -	278
Sistotrema confluens, *Pers.* -	248	Thelephora laciniata, *Pers.* -	264
Cantharellus cibarius, *Fries*, -	258	——— Sambuci, *Pers.* -	242
Polyporus lucidus, *Fries*, -	245	Auricularia reflexa, *Bull.* -	256
Fistulina hepatica, *With.* -	270	Peziza æruginosa, *Pers.* -	241
Phlebia Merismoides, *Fries*, -	280		

Order HYPOXYLA.

	Plate		Plate
Ceuthospora phacidioides, *Grev.*	253	Ceuthospora Lauri, *Grev.* -	254

Order ALGÆ.

Achnanthes unipunctata, *Carm.*	287	Palmella botryoides, *Lyngb.* -	243
——— brevipes, *Ag.* -	295	——— protuberans, *Grev.* -	ib.
Desmidium Swartzii, *Ag.* -	292	——— hyalina, *Lyngb.* -	247
——— cylindricum, *Grev.*	293	Myrionema strangulans, *Grev.*	300
Gomphonema geminatum, *Ag.*	244	Oscillatoria rupestris, *Grev.* -	246
——— minutissimum, *Grev.*	ib.	Calothrix luteola, *Grev.* -	299
Exilaria fulgens, *Grev.* -	291	Conferva ericetorum, *Roth.* -	261
——— flabellata, *Grev.* -	289	——— alpina, *Bory*, -	ib.
Schizonema Smithii, *Ag.* -	298	Ulva furfuracea, *Fl. Dan.* -	265
Monema Dillwynii, *Grev.* -	297	Encœlium Lyngbyanum, *Grev.*	290
——— quadripunctatum, *Grev.*	286	Carmichaelia attenuata, *Grev.*	288
Berkeleya fragilis, *Grev.* -	294	Laminaria debilis, *Ag.* -	277
Chlorococcum vulgare, *Grev.* -	262		

Order MUSCI.

Grimmia leucophæa, *Grev.* -	284	Hypnum trifarium, *W. & M.*	279
Bryum Tozeri, *Grev.* - -	285	——— molle, *Dicks.* -	283
		——— alpestre, *Sw.* -	282